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Editorial Notes

Steadiness and System

IN this time of renewed conflict the Stockport Gas Undertaking, through the nature of its position and the industries operating within its area of supply—industries now working at full pressure—will have to meet heavy and increasing demands for precision heat, which, of course, means heavy demands for gas. That it is meeting heavy calls upon its resources and will be able to cater for future requirements of an abnormal nature is due in large measure to the steady and determined work over the past ten years of Mr. Thomas Reynolds—work backed up by an energetic and far-seeing Gas Committee which has rightly, as results have shown, placed faith in his advice and acted promptly on his recommendations. Mr. Reynolds is the new President of the Manchester District Association of Gas Engineers. The badge of office was handed to him by the retiring President, Mr. Singleton, of Huddersfield, at a meeting held in Manchester on Friday last. The meeting, the proceedings at which are reported elsewhere in our issue to-day, was successful and was conducted in an atmosphere of quiet confidence and genuine good fellowship; there can be few loose threads in the texture of the Manchester District Association.

Mr. Reynolds gave his Presidential Address. That, too, will be found on later pages of this "JOURNAL." There was nothing spectacular about it and there was nothing flamboyant in its delivery. Perhaps—and it is a probability—the Author could and would have said something more dramatic had it not been for the shadow of the Censor; in certain parts of the world not only are words few at the present time, but they also have to be carefully chosen. The Address was a plain tale, a quiet story of what has been accomplished, through the instrumentality of Mr. Reynolds, by the Stockport Gas Undertaking since 1930; and the Address, the Author may be assured, "went down well." Lancashire and Yorkshire men (we almost wrote Yorkshire and Lancashire) are not the least critical among engineers. We consider them fairly keen judges, and we are sure that they admired not merely the way in which, from a purely engineering point of view, the Manchester President has put his house in order, but also the financial acumen which has guided his very systematic plans. The net result of this systematic planning, which, by the way, has not lacked imagination and has certainly not wanted thoroughness and drive, is that while the total capital expenditure has risen from £882,000 in 1930 to £1,241,000 in 1939, the outstanding debt has only increased from £311,000 to £368,000 over the same period. Expressed per million cubic feet of gas made, the outstanding debt has actually fallen from £270 in 1930 to £267 in 1939. Naturally this fact gave rise to congratulatory comment at the meeting. The essential point about Mr. Reynolds' Address, into the details of which we do not intend to enter here—for the Address is for all to read, and we know it will be read—is best emphasized by its final sentence, which is: "For the relatively small increase of £51,000 the works have been completely modernized and should now meet normal developments for a good number of years without the necessity of a large capital expenditure." Which means also that at the present juncture the works are fully equipped and in first-class order to meet in the most economical manner unusual demands in the national service.

An All-Round Effort

NOT that the Address was confined to works practice and improvement in plant and method. Far from it. Distribution reorganization came under survey, as also did the question of showrooms and publicity. About that section dealing with the works, what impressed us very much indeed, and it was obvious that it found warm approval at the meeting, was the great pains at which Mr. Reynolds has been to ensure that his men shall have as comfortable working conditions as possible. Again there is nothing spectacular or thrilling about messroom buildings, cloakrooms with lockers, racks for employees' clothing, and washing facilities; but their adequate provision does mean much. It helps the men by promoting their self-respect; it gives them a new attitude towards cleanliness and smooth-running (which implies economical working) of plant; it leads to sympathetic understanding between employer and employed, which is not a minor consideration. As for distribution, a period of "intense activity" began in 1931, and mainlaying for outskirt supply was undertaken with vigour and with an eye to reserve capacity. Some of the details were recounted by Mr. Reynolds. We may perhaps mention that the sales of appliances during the year ended March, 1930, amounted to £8,210. Sales of appliances reached the figure of £63,000 during the year 1937-38—(a) because there was gas to supply these

appliances at the needed pressure ; (b) because of showrooms and general publicity activities. "Visual publicity," said Mr. Reynolds, by which he meant showrooms, "is the best method of reaching consumers who are not easily reached by other methods." Several branch showrooms came into being. Since the outbreak of the present war people have had to be turned away from the lecture-demonstrations arranged at the various showrooms, which may speak well for the comfortable chairs provided in these showrooms, but also shows how the goodwill of the Gas Industry has been built up by patient effort and how important that goodwill should not be allowed to disintegrate and disrupt as a result of war *malaise*. As a matter of fact, we found little despondency at the meeting of the Manchester District Association of Gas Engineers on Friday last.

Selling of Coke

A VIRILE body of men, these Northerners. Why, therefore, have we criticism to make? One of the questions touched upon by Mr. Reynolds in his Address was coke. We know that it is a vexed question. The Fuel Research Board has made remarkably good surveys of our coal resources. As a result of its work we feel confident that we can place a finger on most of the coal seams of this country which are low or high in phosphorus and arsenic, low or high in volatile matter, low or high in ash. As a result of its work we feel confident that, *via* the Gray-King assay, we can anticipate coke yields and quality. Before the Manchester District Association of Gas Engineers gathered together in business conclave, the members had lunch. The lunch was a very happy affair. Toasts were proposed, and reply was pleasantly and aptly made. All was in order—except? The "GAS JOURNAL" has never dictated policy, but that abrasive material coke came into discussion at the luncheon table; and judging from the "hear hears" we came to the conclusion that a greater measure of co-operation is needed in the large industrial area covered by the Association. The assembly was, we think, unanimous about this

And this brings us back to the meeting and also the Address of Mr. Reynolds. "District Coke Associations have been very active during the past year," he remarked, "and speaking for this district a large number of members, representing 82% of the coke produced, have now joined the Lancashire and District Coke Association. Unfortunately we have not yet reached a definite agreement whereby coke shall be marketed at a uniform price in a definite area. Too many loopholes still exist which enable merchants to undercut the present 'gentleman's agreement.'" There is still something wanting in the attitude of some gas undertakings towards coke sales; general agreement throughout the country is not only desirable, but is essential if full monetary value is to be gained from the Industry's solid smokeless fuel, if cut-throat competition is to be avoided in the future, and if the effects of possible slumps are to be minimized. It must be due to a negative policy from above that so many gas salesmen are indifferent in regard to coke sales, and a strenuous effort ought to be made to rectify the position whereby potential coke sales are being lost because of this indifference. There has not been proportionate sales energy in the coke marketing field, and it will have been noted from our report in last week's "JOURNAL" of a meeting of the London and Counties Coke Salesmen's Circle that at that meeting a resolution was adopted "That this Circle is of opinion that greater co-operation is desirable between gas and coke salesmen."

At the meeting of the Manchester Association, Dr. Townend, the Livesey Professor of Leeds University, spoke of research in general, and in particular of the work undertaken jointly with the Gas Industry at the University, which work may conceivably result in a Gas Industry converting raw coal into gaseous and liquid products only and having no solid fuel for sale. That time, however, is not yet, and it was good to note at the Manchester meeting the keenness displayed in the subject of properly co-ordinated and regulated coke sales and the desire to organize on a long-term basis to ensure as far as possible stability of the market.

Faith in Ourselves

THE address of Mr. Henry Woodall from the Chair, at the annual meeting of the British Gas Light Company, which is reproduced elsewhere in this issue of the "JOURNAL," strikes a note that is particularly welcome at the present time. It might prove difficult to find circumstances in which it would be more necessary for us to have faith in our country, and this faith, of course, we possess to the full. Similarly, it must be felt that never has there been a crisis in which it was more desirable to possess faith in ourselves—and faith in ourselves means, so far as readers of the "JOURNAL" are concerned, faith in the great Gas Industry.

There is ample ground for such faith, even though circumstances created by the existing state of war may have tended to obscure the near outlook. Difficulties have arisen, and these difficulties may be expected to increase, while others are likely to be created; but, as Mr. Woodall said, there is no need for despondency. On the contrary, there is every justification for belief in the continued growth and success of the Industry. This is the longer view, and it is the view on which we would urge readers to keep their minds fixed. Continued growth and success lie ahead, whatever temporary difficulties may be lurking in the foreground. It is faith in the future of our Industry that will enable us to see beyond the present difficulties.

Just how far ahead these happier times may be, no one can now say, and so the only safe policy to urge in the circumstances is a policy of preparedness. As Mr. Woodall told the proprietors of the British Gas Light Company: "We shall not sit down and wait on circumstance, but shall keep up our various undertakings so as to be ready to meet, as far as we can, any emergency." It will be realized, of course, that "any emergency" may even mean a sudden accession of business, and faith in our Industry must lead to the constant keeping in mind of this possibility. Soaring coal prices, "black-outs," and like disabilities, may be beyond our control, but it should be within our power to "keep up our various undertakings," and the soundness of this policy will be assured of manifestation in due course. Plan now, as far as may be, with an eye to the future, and, while awaiting that future, shun those enemies of progress—defeatism and inferiority complex. Were there nothing else in the scale, the work which the Industry is doing now—the vital work—in the national interest, properly appreciated, should assure a generous return in time to come. A reminder of this work is contained in the announcement that the British Gas Light Company have at the moment in course of erection several additional plants for the extraction of benzole, &c., "always useful, but never more so than now."

The Board of the Company have adopted a broad financial policy—feeling that, though the usual dividend has not been actually earned on this occasion, regard must be had to the fact that there is an ample margin available for its payment, and that stockholders have to meet the burden of the heavy increase in the rate of income tax. At the moment, the experiences of the Company's many undertakings—41 in all, large and small—are not in all cases exactly alike, because circumstances differ, but all can claim those advantages of gas which Mr. Woodall quoted as among the reasons for the faith of the Directors in their Company and in their Industry. In the control of so many undertakings there is also the important advantage stressed by the Chairman, that at periodical meetings of the engineers of the different works an opportunity is afforded to pool accumulated experience, and to discuss their own immediate problems, to the benefit of the whole concern.

Radiation Meeting

ON other pages of this issue we give a full report of the Annual General Meeting of Radiation Ltd., which was held last Thursday. With a decline in net income from £277,831 to £133,878, the meeting might not have been expected to be a very cheerful one for shareholders, yet it is quite clear from the report that they have nothing about which to be despondent in the long run. Apart from the fact that the intrinsic strength of the concern is well known, the energetic policy which is being pursued by the Board ensures as far as is humanly possible a readiness to resume normal business with a flying start when world conditions once more permit. In the meantime emergency war work is a national duty gladly undertaken, but it appears that even yet Radiation have not been called upon to the fullest extent for which their great organization is fitted. It is not our purpose to discuss matters of munitions supply, but it seems strange that the Chairman at this stage of the war should be able to speak "the *much* greater service" which the Company could render to the country if the opportunity were given; presumably the same comment would apply to many other splendidly equipped firms which supply the Gas Industry in normal times with heavy and light equipment.

Of chief interest to the Industry—apart from getting on with the winning of the war—is the story of progress in gas development which Sir C. Herbert Smith was able to relate. In spite of the really difficult times which appliance makers are known to have had in the years preceding the war, and the drastic cutting off of business on its outbreak which coincided with the months which are normally the best, the Chairman was able to give a most cheering account of continued intensive research work. This has not only in recent months produced the new luminous fires, one of which especially represents "such a departure from the gas fire as hitherto known as to have a stimulating effect on the Gas Industry," but promises shortly still another of revolutionary design to the appearance of which we shall look forward with liveliest interest.

The courage of Radiation in going ahead with such new productions at the present juncture will commend itself to all. Business for gas undertakings is admittedly difficult. There is, all the same, a feeling in many quarters that they have accentuated the difficulties as far as new business is concerned, and that a little more drive and a little less complacent acceptance of the situation are required. If they can see their way to taking this view, they are clearly assured of the hearty co-operation of the appliance makers. Only recently we wrote of the tremendous effort which Radiation is making to safeguard goodwill. The supply side of the Industry will be very shortsighted if they fail to give all possible support to the efforts of the appliance makers to keep the flag flying.

Food Education Campaign

The importance of giving a good send-off to the Gas Industry's Food Education Campaign was emphasized by Mrs. Eileen Murphy in a talk to the "JOURNAL" about the plans for the luncheon and afternoon meeting at the Dorchester Hotel on April 12. At the luncheon Lord Kennet will be in the chair, and the chief speakers will be Mr. W. S. Morrison (Minister of Food), Sir David Milne-Watson, and Miss Ethel Willans, M.B.E. At the afternoon meeting—which is being specially held for the Gas Industry's demonstrators—the chief speaker will be Dr. H. E. Magee, M.B., D.Sc., of the Ministry of Health.

"I think it is generally recognized," said Mrs. Murphy, "that the demonstrators will be the 'front line troops' in this Campaign. We are, therefore, particularly anxious that they, as well as the executives of undertakings, should be present on April 12. We have already had encouraging replies from many undertakings and we hope that within the next few days the additional responses will assure us of record attendances at both the luncheon and the meeting. Although our gas demonstrators have been giving demonstrations on properly balanced diets and economical cookery for years, they will now be carrying on the work at higher pressure and within the framework of the Government's scheme. By their attendance on April 12 the demonstrators will be able to hear first-hand from the Minister of Food himself what his scheme is for educating housewives—how he plans to reach all classes of the public, young and old, rich and poor. At the conclusion of the demonstrators' meeting it is hoped to introduce demonstrators to the Ministry of Food's Liaison Officers, who will be working in their districts."

We hope there will be a ready response to Mrs. Murphy's plea for a full attendance at this gathering. The Gas Industry has an important part to play in the Food Education Campaign—and we must demonstrate our willingness to co-operate right from the start. Reference to the Campaign is made on a later page.

Between-Season Heating

In discussing editorially, in our issue of March 20, the "Value of Advertising," we referred to the electricity industry's advocacy of their portable fires particularly between the end of winter and the beginning of spring. As we pointed out, this load is equally available to our Industry, and our attention has been called to the fact that in that very issue the Parkinson Stove Company alone advertised three types of portable gas fire. There are types of this handy appliance, in fact, to suit all tastes, and there should be a real demand for them practically throughout the year. But their particular advantages, in many positions, are most felt in the spring and autumn, when for the chilly evenings and early morning use they fill a real need. Gas undertakings might well concentrate especially at these seasons on an appliance which, owing to its utility, attractive appearance in a variety of shapes, and very reasonable price, is not by any means difficult to sell.

"Gas Journal" Directory

In order that readers may be able to keep the particulars contained in the "JOURNAL" Directory up to date, we summarize in the following list various changes of which we have been advised during the past month:

Page 14. CAMBRIDGE. A. E. King, S., retired. J. Hunter Rioch appointed E., G.M., & S.
„ 32. HASTINGS. J. H. Hornby appointed E. & G.M. *vice* C. F. Botley, retired.
„ 40. LEIGHTON BUZZARD. R. Ruggles appointed E.M. & S. vice H. G. Ruggles, retired. (See also Aspley Guise, page 4, and Woburn, page 78.)
„ 46. MELTHAM. H. K. Lister appointed E. & M.
„ 60. SANDWICH. L. G. Mills appointed E. & M. *vice* J. Giles, retired.
„ 82. BURNTISLAND. W. Brown, E. & M., to retire.
„ 84. DARVEL. J. Young appointed M.
„ 88. KILMACOLM. R. T. Duncan appointed M.
„ 90. LASSWADE. J. MacMillan appointed E. & M. *vice* R. T. Duncan.
„ 90. MUIRKIRK. W. Sheach appointed E. & M. *vice* J. MacMillan.
„ 147. YORKSHIRE JUNIOR GAS ASSOCIATION. G. E. Banks (Sheffield), Hon Secretary.

Hinckley to Have Gas Lighting

The whole of the Urban District of Hinckley—which has a population of 36,000—is to have wartime street lighting by gas. At a recent meeting of the Council the Gas Engineer and Manager stated that the cost of public lighting by gas to conform to the official "starlight" illumination would be 8d. per therm, which, burning night and day for a period of 30 weeks from the middle of September till the middle of April, would amount to £1,750. This was approximately half the cost of peace-time public lighting.

It was agreed by the Council that all the lamps be adapted to wartime use and lighted in accordance with the Gas Engineer's statement. The Chairman of the Gas Committee referred to the compliments which had been paid to the Gas Department following the initial installation of wartime street lighting in certain thoroughfares. The Committee felt they were doing the public justice in this matter, and it was observed that residents were satisfied with the efforts that were being made to render the streets safer and easier to negotiate after dark.

Personal

The wedding took place at St. Barnabas Church, Pimlico, on March 27, of Mr. MICHAEL MILNE-WATSON, younger son of Sir David and Lady Milne-Watson, and Miss Mary Lisette Bagnall, younger daughter of the late Mr. and Mrs. H. Bagnall, of Auckland, New Zealand.

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Last Wednesday, March 27, Mr. CLIFFORD A. KING was installed in the Chair of the Evening Star Lodge of Freemasons, No. 1719. It is interesting to recall that just 50 years ago his father, the late Walter King, was installed in the same position.

Obituary

The death took place on Good Friday, at the age of 81, of Mr. SIMEON RAYMONT, a Director of the Tavistock Lighting, Coal, and Coke Company.

* * *

The death has occurred, at the age of 71, of Mr. HAROLD ADAMS, who for a quarter of a century was Chairman of the Dartmouth Gas, Coke, and Coal Company. The Company was represented at the funeral, on March 23, by Messrs. J. B. Cattle (Managing Director), A. Tucker, S. Corber, R. Saunders, and J. Thompson.

* * *

Mrs. E. WYLES, who died recently following an accident at Enfield, Middlesex, was the widow of Mr. A. Wyles, Manager of the Dawley Gas-Works at the time of his death in 1921. Their youngest son, Mr. R. E. Wyles, is Engineer, Manager and Secretary of the Castletown Gas Light Company and the Castletown Waterworks Company, Isle of Man.

* * *

Mr. C. H. LANE, West of England Representative of Messrs. Robert Cort & Son, Ltd., Engineers and Ironfounders, of Reading, died at Bristol on March 23. The funeral took place at Westbury-on-Trym Cemetery on March 28.

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The death occurred on Friday, after three months' illness, of Mr. JOHN BYRNE, Manager of the Bray (County Wicklow) Gas-Works, a subsidiary of the Alliance and Dublin Consumers Gas Company. Mr. Byrne, who was formerly a fitter, was in the service of the Company for twenty-five years.

* * *

Mr. S. J. B. TULLY, a Director of the firm of Tully, Sons, & Co., Ltd., gas engineers and contractors, of Millgate, Newark, died recently in Newark Hospital, aged 57.

Forthcoming Engagements

April

4.—B.C.G.A.—Annual Meeting of members in the Southern District, at Gas Industry House.
4.—L.C.C.A.—Technical Committee, 2.30 p.m.
5.—London and Southern Juniors.—Meeting at Gas Industry House, 7 p.m. Paper by J. E. Cooper (Gas Light and Coke Company) on "Features of the Performance of Gas Water Heaters."
5.—North British Association.—General Meeting at Glasgow. Papers by D. D. Melvin (Edinburgh) and T. S. Lockhart (Rothesay).
6.—Western Juniors.—Meeting at Bristol. Discussion on "Wartime Problems Affecting the Gas Industry."
8.—B.C.G.A.—Executive Committee, Gas Industry House, 2.15 p.m.
9.—N.G.C.—Central Executive Board, 2.30 p.m.
9.—I.G.E.—Finance Committee, 1.45 p.m.; Membership Committee, 2.15 p.m.; Benevolent Fund Committee of Management, 3 p.m.
9.—Federation of Gas Employers.—Central Committee, Gas Industry House, 11.30 a.m.
9.—I.G.E.—Finance Committee, 1.45 p.m.; Membership Committee, 2.15 p.m.
10.—I.G.E.—Board of Examiners, 10.30 p.m.
11.—S.B.G.I.—Emergency Committee, 56, Victoria Street, S.W.1, 2.30 p.m.
11.—B.C.G.A.—Annual Meeting of members in the Midland District, Grand Hotel, Birmingham, 2.30 p.m.
12.—I.G.E.—Pipes Committee, 3 p.m.; Gas-Works Safety Rules Committee, 3 p.m. (joint session).
15.—L.C.C.A.—Finance Committee, 10.45 a.m.; Executive Committee, 11.15 a.m.; Central Committee, 2.15 p.m.
15.—B.C.G.A.—Annual Meeting of Members in the South Wales District, Gas Offices, Bute Terrace, Cardiff, 3 p.m.
16.—I.G.E.—Gas Education Executive Committee, 2 p.m.
17.—Southern Association.—Eastern District Meeting, Gas Industry House, 2.30 p.m.
18.—Midland Coke Association.—Annual General Meeting, Grand Hotel, Birmingham, 2.30 p.m.
19.—I.G.E.—Chairmen's Technical Committee, 2.30 p.m.
20.—Yorkshire Juniors.—Short Paper Meeting.
24.—I.G.E.—Library Committee, 2.30 p.m.
27.—Manchester and District Juniors.—Meeting at Stretford. Papers by J. C. Hogg on "Carbonizing of Stock Coal," and by H. Q. Marris on "Sales of Appliances in Wartime."

Letters to the Editor

Ice in Gasholder Tanks

SIR,—I do not think that Mr. Milbourne can fairly be said to have substantiated his claim that he has dealt with all the questions that I raised; nor do I think his answers reveal a satisfactory appreciation of the difficulties that an operating engineer can foresee. The argument can now well be left to the operating engineer to decide for himself, but there are certain considerations to which attention should be drawn.

Mr. Milbourne does not distinguish as he should do between a gasholder tank sunk in the ground and a steel tank above ground level. His answer to Mr. Toogood makes this clear. A sunken gasholder tank is very much easier to deal with than a raised tank, because it is insulated from the cold winds by the ground, and most of it will be below the level likely to be affected by any frost. The cooling effect is therefore far less, and will be predictable by the principles enunciated in the elementary text-books on heat to which he referred Mr. Toogood. A tank above ground, however, is very different, and if Mr. Milbourne will consider the physics of fluid flow, he will see that ice will form on the side just as readily, perhaps more readily, than at the top surface.

There has also been confusion in Mr. Milbourne's mind between different types of anti-freezers. In my letter I said: "My solution is the standard one, properly applied—namely, anti-freezers." Mr. Milbourne writes as if I said "the ordinary standard form of anti-freezing apparatus." There is a vast difference between the two, implicit in the words "properly applied." I need not elaborate this beyond saying that while Mr. Milbourne's "ordinary standard form of anti-freezing apparatus" may have given trouble in respect to ice formation, the form to which I referred has prevented ice formation in all the instances of which I have knowledge.

If a pump is not necessary when applying Mr. Milbourne's method 2, how deeply must the boiler house be excavated, and how can he keep it from being flooded with water in wet or snowy weather without a pump? On the other hand, if put at ground level, with most gasholders a pump circulation would be necessary. I would remind him also, that with the arrangement as he shows it the possibility of the tank outlet pipe breaking is a grave practical defect, and that this breakage may not always be due to freezing.

Mr. Milbourne still fails to explain in what way the calorific value of the gas will be affected by steaming the gas in the holder; any water that he puts into the gas will be condensed before it reaches the consumers' meters. That being so, my suggestion of a condenser on the holder outlet might not be as far fetched as he seems to believe.

Keeping the tank water from freezing is a chemical engineering problem, and no chemical engineer would attempt on practical or economic grounds to transfer heat to water by warming a mass of gas lying more or less quiescent above the water. The loss of heat would be very great and the heating efficiency almost absurdly low. Moreover, Mr. Milbourne does not meet my fundamental objection as to the complete breakdown of this method (his Figs. 3 and 4) when for any reason gas is not entering the holder.

1, Wellesley Crescent,
Strawberry Hill,
Twickenham.
March 30, 1940.

Yours, &c.,
G. E. FOXWELL.

SIR,—Apropos this discussion, there are a number of large gas-works in Canada. Winters there are invariably more severe than even our worst. I therefore suggest to Canadian gas engineers (many of whom must see the "JOURNAL" regularly) that they might contribute very materially and convincingly to this discussion by telling us of their experiences and informing us of the methods used to enable water tank holders to be maintained in full commission during their longer winters.

Yours, &c.,
J. C. K. BALFRY.

"Stapenhill," Christine Avenue,
Wellington, Shropshire.
March 27, 1940.

News of the Week

A Loan of £1,000 is to be sought by the Ashton-under-Lyne Gas Committee for the provision of gas meters and appliances for hire-purchase.

From March 30, 1940, the address of the Head Office and Southern Branch of the Coal Utilization Joint Council is General Buildings, 99, Aldwych, London, W.C.2. Telephone: Holborn 3326; Telegraphic address: "Promocoal, Strand, London."

How to Make the Most of Rations, and wartime cooking generally, was the subject of an address to the Plymstock Townswomen's Guild recently by Miss K. Jenkin, the cookery expert of the Plymouth and Stonehouse Gas Light and Coke Company.

At a Special Meeting held on March 18, employees of Boston Gas Light and Coke Company decided to form a Savings Group to help in the National Savings effort. Some 50 members have already been enrolled, and it is hoped that the Group will increase as time goes on.

The Macclesfield Gas Showrooms are shortly to be transferred from the building adjacent to the Town Hall to premises in the Market Place. The Borough architect reported to last week's meeting of the Finance Committee that the cost of necessary repairs to the present showroom building would be out of proportion to the value of the accommodation which would be preserved.

Modified Gas Lighting in Wombwell is stated by the local Press to be "undoubtedly a great success as representing the difference between the best that can be permitted in wartime, and no light at all. These lamps have been fitted where they should prove a real boon to people who under normal black-out conditions must have felt like prisoners in their own homes during a long and dreary winter. The deputation of the Gas Committee which went to London to inspect this form of public lighting took a risk which, one must now agree, has been well justified."

Realizing the Value to the housewife of practical advice on wartime cookery, the United Kingdom Gas Corporation, Ltd., has arranged a special series of demonstrations in collaboration with the Parkinson Stove Company. The Demonstrator, Miss Grace Hiscox, M.C.A., has prepared a programme designed to deal with the problem of catering with restricted food supplies, and varied menus have been given daily on the modern Parkinson gas cooker. These cookery lectures have already been enthusiastically received by housewives in the areas supplied by the Radcliffe, Farnworth, and District Gas Company and the Rossendale Union Gas Company; the demonstrations will be given by other constituent Companies of the Corporation during the ensuing weeks.

Architects and Builders with Vision have long realized that the soul of a building, speaking not too literally, may be mirrored in its lines and the arrangement of massive piles of masonry. Add to that a harmonious design of windows and lighting effects and the result is a masterpiece. That is particularly true of churches, says the New Jersey Public Utility Information Committee. In the city of Paterson, New Jersey, is a studio from which emerges stained glass windows that have achieved international reputations. The work of putting together a large stained glass window is a long and exact process, and colouring is most important. The most satisfactory results in fusing paint into glass have been obtained by firing the glass to about 1,200° in a gas-fired furnace. Gas has made possible an evenness of colour previously unknown and has eliminated a considerable loss in off-colour glass that had to be discarded.

Co-Partner Employees in the Chester United Gas Company held their annual meeting at the Roodee Works last week, when it was reported that the co-partnership bonus had been maintained at 6½%. Mr. Richard Farmer, who presided, was accompanied by Mr. William Cullimore and Mr. Humphrey Gamon (Directors), Mr. H. Hopkinson (Secretary) and Mr. J. H. Noble (Engineer). Almost £1,000 had been used by members to purchase the Company's stock, said the Chairman, and holdings of stock by employees and representatives of deceased co-partners now approached £11,000. He asked members to realize in an increasing degree how their personal interests were bound up in the success of the Company and the satisfaction of every gas consumer. The past year was another record year in sales of gas in spite of the adverse effects of the war. Since the beginning of this year they had also had very large increases in output of gas, the abnormally severe weather having created a huge demand.

Provision is Being Made in the estimates of Oswaldtwistle Gas Committee for the coming year for restricted street lighting during the blackout.

Work is to be Put in Hand Immediately with the reconstruction by Messrs. Humphreys & Glasgow, Ltd., of the water gas plant at Lancaster Gas-Works.

Satisfied with the Light given by the trial lamp installed by Derby Gas Company, the Lighting Committee of the Darley Abbey Parish Council is to tour the village to ascertain where more of the lights are needed. The trial lamp consumes only two pennyworth of gas a day.

In Full Settlement of their claim for payment for the street lighting contract uncompleted as a result of the war, the Coatbridge Gas Company has agreed to accept £894 from the Coatbridge Town Council. The original sum sought was £2,018, being one-third of the amount which would normally have been paid.

At the Annual Meeting of the shareholders of Baird's & Scottish Steel, Ltd., held in Glasgow on March 29, Mr. H. C. Waterson (Vice-Chairman), said that in connexion with their £500,000 extension scheme, coke oven batteries would shortly be erected at Gartsherrie, where surplus gas would be used for neighbouring iron and steel works. Coke ovens would also be installed at Kilsyth for the production of foundry and electrode coke.

The Canteen recently opened in High Street, Leamington, for the benefit of soldiers waiting for the 'buses is doing great business. The Soroptimist Club set it going and enlisted the help of other women's organizations in maintaining it. On a recent Saturday no fewer than 300 soldiers availed themselves of the Canteen, when the Mayor and Mayoress were two of the busiest helpers. The Canteen is a very snug place, with its buffet warmed by a Flavel panel heater; the sitting-room has a coke fire (lighted by gas), while the kitchen is equipped with one of Flavel's largest cookers.

One of the First Gas-Operated Radios ever shown in America was exhibited not long ago in Springfield, Mass. It was on exhibition for almost a month and was viewed with great interest by many thousands of people. So that it could be seen that no wires connected it, other than the earth and aerial, the radio was set up on glass blocks with a glass tube for the gas supply. A mirror showed the gas flames. The gas-operated wireless set has been in use in England for some time and was the subject of a detailed description in the "JOURNAL" last July.

A Proposal to Amalgamate the sales and showroom organization of the Blackburn Corporation Gas and Electricity Departments will be moved by Councr. R. F. Mottershead, leader of Blackburn Town Council, at the April meeting. The minute also suggests joint reading of gas and electricity meters and a system of continuous billing. A standing committee of 13 will be appointed to control the proposed joint organization, the functions and personnel to be settled by a sub-committee consisting of the Chairman and Vice-Chairman of the Gas, Electricity, Finance, and Gas and Electricity Joint Sales Committees.

"Home Tidings"—the quarterly magazine of the Manchester Branch of the Women's Gas Council—is back once more in its original form, and, in spite of being of necessity somewhat "thinner" than of old, it is as full of interest as ever. In these days such a publication serves a valuable purpose in keeping members in touch with the Branch and with each other, particularly now when so many are scattered or are not in a position to attend meetings and demonstrations. The foreword of the present number is a message from the Lady Mayoress of Manchester (Mrs. G. Harold White), who is President of the Branch.

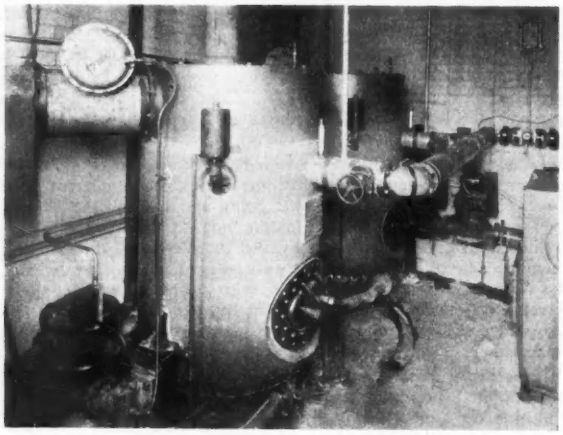
The Failure of the Gas Supply at Stow-on-the-Wold was discussed by the Parish Council at their meeting last week. It was stated that the Stow Gas Company again failed to supply consumers in the parish with gas from about 6.30 p.m. on March 17 until 10.30 a.m. on March 24, following upon the cessation of supply for 19 days in January and February. The Clerk reported that, as directed, he had written the Board of Trade with full particulars on March 6, but other than an acknowledgment of receipt of the letter he had received no reply. It was resolved that further facts be forwarded to the Board of Trade for their urgent consideration and advice.

Middlesbrough's New Council School Heated by Gas

OWING to modern educational developments it was decided that the whole of the old Fleetham Street Board School, the first school to be erected by the Middlesbrough School Board, should be demolished and replaced by a school building which would be modern in design and equipment.

The new building, which cost £21,668, takes the form of a long two-storey block with the Infants' Department on the ground floor and the Junior Department on the first floor. To be in keeping with the general design and to reduce the height of the building in an already built-up area, it was decided that the roof should be flat.

The lower floor comprises a hall, playroom, six normal size classrooms, two larger classrooms, separate cloakrooms for boys and girls, Head Teacher's room, and staff room, each with lavatories and stores adjoining. The upper floor includes a hall containing a large stage, six normal size classrooms, two large



class-rooms which are used as craft rooms, cloakrooms, Head Teacher's room, and staff rooms, &c. On the roof level is a nature study room. All teaching rooms have a sunny aspect and the windows on the south-west side have been made as large as possible to admit the maximum amount of natural lighting.

The building is heated by pipes and radiators on the accelerated low-pressure hot water system. The boilers used are two Cochran Kirke "Sinuflo" No. 7D with a total rating of 1,550,000 B.Th.U. and a maximum gas consumption of 4,200 cu.ft. per hour. The boilers are thermostatically controlled by means of a Drayton temperature regulator, surface water-switch, and variostat. "Hurro" gas-fired water heaters supply all the necessary hot water, while the staff rooms have gas fires for local heating.

Ice in Gasholder Tanks

Automatic System of Heating Sealing Water

APROPOS the correspondence we have recently published in the "JOURNAL" regarding the freezing of the water seals of gasholders, the Bristol's Instrument Company, Ltd. (Brent Crescent, North Circular Road, London, N.W.10), have sent us particulars of an interesting and successful application of the Bristol automatic temperature control system in the United States.

The purpose of the system is automatically to control the seal water temperature slightly above freezing, regardless of variations in atmospheric temperature. The particulars relate to a test carried out at one of the holder stations in the New York Metropolitan District during the winter of 1928-29 to determine the amount of steam required to heat the seal water in a 3,000,000 cu.ft. gasholder. The test was started on Nov. 23, 1928, and was completed on March 19, 1929. The average temperature was noted each day and the amount of steam used recorded by a recording flow meter. The test was made under the usual conditions of manual control, and the usual instructions were given the operator for heating the seal water.

As a result of the test, it was found that the cost of heating ranged from $25 to over $36 a day. When these figures were compared with the average atmospheric temperature, it was found that it ranged from 16° F. to 49° F. On many days when the average was well above freezing practically the same amount of steam was used as on days when it was as low as 20° F. Seal water temperatures ran as high as 100° F.

Comparing two days, in spite of the fact that the temperature difference was 26° F., practically the same amount of steam was used—$32.36 for Jan. 18, 1929, and $33.51 for Jan. 13. The total cost of steam for 1928-29 was $3,399.77.

To eliminate the undesirable features of manual control it was decided that the Bristol automatic control system, Model 177, should be used during the winter of 1929-30. The control was installed with the controller bulb in the top seal midway between two steam nozzles at the coldest point on the circumference of the holder. The control valve was installed in the steam line close to the boiler.

The controller was put into operation on Dec. 1, 1929, and was set to maintain the holder seal water temperature at 50° F. at all times, regardless of variations in atmospheric temperature.

The cost of heating for December-March for the winter of 1929-30 was $2,427.59. As stated, the cost of heating for the winter of 1928-29 was $3,399.77. The difference between the costs for the two years was $972.18, which represents the saving in steam alone by the use of the Bristol automatic control system, Model 177.

Drakes Limited

The thirty-eighth annual report of the Directors of Drakes Limited, of Halifax (Yorks), for the year 1939, states that the credit balance on Profit and Loss Account brought forward is £15,860, and the net profit for the year (after provision for taxation) amounts to £10,293. The Directors recommend the payment of arrears of preference dividend for four years, 1931-1934, inclusive, absorbing £9,600, and leaving to be carried forward a balance of £16,553. They record with regret the death during the year of Mr. J. Wilfrid Drake, after a long illness.

At the beginning of the present year Falk, Stadelmann & Co., Ltd., moved into new branch premises at 50, Wellington Street, Leeds. Here is a corner of the attractive showroom where "Veritas" lighting and heating appliances are displayed. It will be seen that a prominent feature is made of the "Newhome" gas cooker

Wartime Street Lighting by Gas

With over 800,000 gas lamps normally in commission in this country for street lighting purposes, it is not surprising to learn that already installations or sample installations of the new low-power gas lighting fittings are being erected for over 300 local authorities throughout the country. Many more Councils are considering the matter.

The following are some of the districts normally lighted partially or wholly by gas in which the gas undertakings or Councils have already ordered from 50 up to 3,000 or more of the new gas lighting fittings :

Between 500 and 3,000 fittings ordered

Bristol	Burnley	Coatbridge
Darlington	Finsbury	Leicester
Rotherham	Sheffield	Shrewsbury
Westminster		

Between 100 and 500 fittings ordered

Belfast	Bolton	Bradford
Crewkerne	Glasgow	Glastonbury
Hamilton	Kilmarnock	Lytham St. Annes
Manchester	Newry	Northampton
Oldbury	Oswaldtwistle	Rochdale
St. Helens	Stourbridge	Stratford-on-Avon
Stretford	Wellingborough	

Between 50 and 99 fittings ordered

Birmingham	Blackburn	Blackpool
Coventry	Darwen	Eccles
Hinckley	Kendal	Loughborough
Malton	Neath	Nelson
Nottingham	Shaftesbury	Shirebrook
Wallasey	Wedmore	Wombwell

Prestige Publicity at Boston

The Boston Gas Light and Coke Company have co-operated to a marked degree in the B.C.G.A. Prestige Campaign. Special prominence was given to the "Sinews of War" window display, which was supported by 16-sheet posters and "Mr. Therm Fires the Guns" leaflets.

Mr. W. C. Chapman, the Engineer and Manager, tells us that the display aroused great local interest, and it was evident that few people were aware of the range of by-products extracted at a modern gas-works or their significance in prosecuting the war. The interest which was aroused locally may be judged from a considerable amount of editorial space given in the local Press on the subject of how gas helps our war effort.

The newspaper stated that in twelve months the Boston Gas Light and Coke Company produce, in addition to gas : 38,000 gallons of crude benzole spirit ; 90,000 gallons of prepared tar ; 50,000 gallons of tar oil ; 100 gallons of sulphate of ammonia ; 6,500 tons of coke.

Much of the 90,000 gallons of prepared tar goes to the repairing and making of roads not only in Boston, but in the Boston Rural District and throughout the Holland Division, and provides a very convenient local source of supply. Over 80% of Boston's coke output is consumed locally, a large proportion being used in domestic boilers which have become so popular during the past few years.

Gas-Heated Grills

Grilling Unit Supported Exclusively by the Burner

Among new patents is one taken out by R. & A. Main, Ltd., and G. W. Wortley (No. 517,760 ; application date, July 27, 1938). According to this invention the grilling unit of a gas cooker is supported exclusively by the burner at three points of support. With this arrangement, observe the patentees, although the grilling unit may distort under the action of heat, it will be firmly supported on the burner.

The burner tube may be provided at each end thereof with a laterally-extending arm which is arranged to support the grilling unit at a location away from the burner, and the grilling unit may be provided at the centre thereof on that side adjacent the burner with a projection which is arranged to rest on the burner.

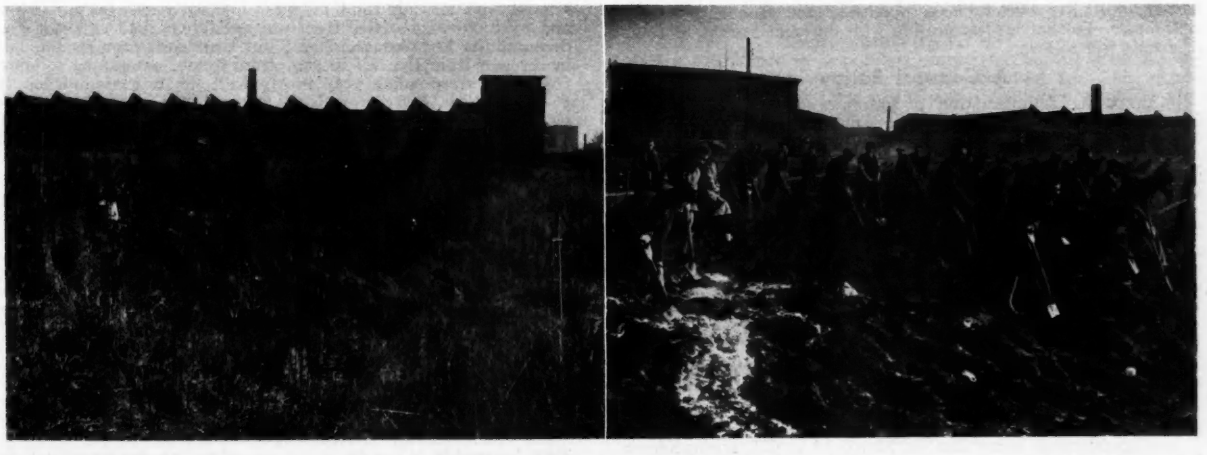
The grilling unit may comprise a fret mounted within a hood-like cover-plate having sides which extend beneath the fret except that side adjacent the burner. A grilling unit of this kind may be supported on the burner between the laterally-extending arms by providing the arms at the extremities with abutments so that an abutment at one end of the burner is directed towards an abutment on the other, and by providing the sides of the cover-plates with slots which are engaged by the abutments and by forming a projection on the cover-plate which engages the centre portion of the burner tube.

The burner tube may be provided with a row of orifices along each side, and the laterally extending arms are arranged to project on each side of the tube. With this arrangement a grilling unit may be disposed on either side of the burner tube.

Gas Cookery in Wartime

Every housewife is affected by the rationing and increase in price of certain foodstuffs. As a consequence, economy in fuel consumption and dieting is a vital necessity. A pamphlet has just been issued by Stoves, Ltd., of Rainhill, suggesting simple and practical wartime recipes to help the housewife.

These recipes, which cover a wide variety of dishes, are planned to get the most out of the food available and to make the fullest use of the cooker—both oven and hotplate. All the recipes have been tested in the firm's Research Kitchen by their Cookery Demonstrators and will be found economical and practical in use. It is observed that the recipes were tested on the firm's streamline "Newhome" cooker, which has the "Autokook" oven heat control, "Duex" grill-boil burner with circular grill, and many other up-to-date features. One section of the recipes demonstrates how a complete dinner can be cooked on this grill-boil burner alone.



From Weeds . . . . Ascot "Dig for Victory" . . . . To Seeds

Our photographs show the remarkable difference which has been effected in a relatively short time in the ten acres of previously unused land surrounding the Ascot Gas Water Heater Works on the North Circular Road. All hands help to do the spade work in converting this hitherto unproductive ground into valuable allotments which will be cultivated by employees

National Food Education Campaign

B.C.G.A. Co-operation

THE Government's National Food Campaign will be launched at a meeting on April 5 in the Queen's Hall, London. Mrs. Neville Chamberlain will preside and the Rt. Hon. W. S. Morrison, M.C., K.C., Minister of Food, will speak on the Ministry's national movement for promoting the right use of food in wartime.

The purpose of the movement, as explained in a letter sent by the Board of Education to Local Education Authorities, is to make guidance available to all members of the public on problems connected with the use of food. In particular, it is desired to show housewives how to make the best use of the foods available, especially home-produced foods, so that health may not suffer as a result of wartime diet; and in general the aim is to take the opportunity, at a time when war restrictions are making people think more carefully about diet, of spreading as widely as possible good advice on catering and cooking. The rationing of certain staple foodstuffs (which is necessary to relieve the burden on our shipping and to economize our foreign exchange), variations in the available supply of others, and the necessity of the wider use of home-produced foods, will present the housewife with new problems. It is therefore the intention to provide, in a very simple form, advice and information on the available supplies of different foodstuffs from time to time, and on the most suitable alternatives to those of which the supply is short, while the chance thus offered of securing a wider understanding of the essentials of a sound diet will not be overlooked.

The Gas Industry's Part

At the Ministry of Food's request, the Gas Industry will play a special part in this national propaganda. Its Home Service is well known. It has wide experience in food education and exceptional facilities for contacting women, and through the organization of the British Commercial Gas Association a "How to be Fitter though Rationed" campaign is to be run parallel to the Ministry's propaganda. This campaign will be launched at a luncheon to be held at the Dorchester Hotel, London, on April 12. The Minister of Food will be the chief guest and speaker. After the luncheon a special meeting for demonstrators will be held at the hotel, the chief speaker being Mr. H. E. Magee, M.B., D.Sc., of the Ministry of Health.

By launching its campaign at this time, the Gas Industry will benefit by the current public interest in food problems which will be fostered by national Press editorials, broadcast talks, and other methods which are to be adopted in the Government's campaign.

To follow up the launching of the campaign nationally, material for local use has been prepared by the B.C.G.A. This covers advertisements, films, editorials, window displays, ideas for demonstrations, special recipes, &c. It will be circulated immediately it is possible to add fininshing touches to bring it in line with the Food Minister's policy which he will explain to the nation on April 5. The first of the Association's leaflets "Your Food and Health in Wartime," by Sir John Orr, a leading authority on nutrition, has already been published and has been widely welcomed. Further leaflets dealing with different aspects of food problems will follow.

A General Policy

In preparing demonstration programmes it is only necessary for gas undertakings to follow the general policy of the Food Ministry. Programmes should not be planned ahead for long periods as it will be necessary to tie-up lectures according to the availability of the various foodstuffs. For instance, just now it is a matter of policy to popularize figs, potatoes, and oatmeal. The Ministry also advises demonstrations on unrationed meats, fish, meatless dishes, vegetable cookery, soups, sugar, and fat problems. Leaflets dealing with these subjects will be issued by the Ministry at intervals. Number 1 of the series will shortly be available to all housewives. It is called "Our Food To-day—How to Eat Wisely in Wartime," and deals with the principles of nutrition under the headings Body Builders, Energy Foods, and Protective Foods.

Area officers of the Food Ministry will co-ordinate the work being done all over the country. The B.C.G.A. will be ready to give the name and address of Officers appointed to any district as soon as the Ministry releases this information.

As already stated in our issue of March 27, p. 675, arrangements have been made by the Ministry of Food for the issue of sugar and meat for cookery demonstrations by means of permits from the Food Executive Officer. Applications for these supplies should be countersigned on behalf of the Local Education Authority and subsequently sent by the applicant to the local Food Executive Officer.

Edinburgh Gas Department

Effect of War on Production Costs

A REPORT by Mr. James Jamieson, Engineer and Manager, approved by the Committee of the Edinburgh Gas Department on March 29, sets out the position at the end of approximately six months of war. It will be remembered that Mr. Jamieson made a previous Report which was referred to in our issue of Nov. 1, when it was decided that no alteration should be made in the price of gas until the position became clearer and the effect of war on sales more apparent.

In the provisional estimates for 1940-41, the estimated loss in revenue, assuming the same price of gas as this year, is £64,855. The price of gas will in consequence have to be increased by about 20%. While the suggested increase may seem considerable, it should be pointed out that Edinburgh gas is among the cheapest in the country, and has lately been below the pre-1914 level of prices although the price of coal is 100% more than in 1914.

Since the present method of charging for gas was introduced in 1934-35, the average price has been steadily falling from 2s. 8d. to 2s. 5d. per 1,000 cu.ft., even although during the same period costs have been steadily rising. It is worth recording that even before the war had started enormous increases had already taken place in the materials of gas manufacture and distribution, and in wages. For example:

Coal	25% increase.
Gas oil	10% ,,
Gas appliances	10% ,,
Meters	30% ,,
Steel plates and bars	35% ,,
C.I. pipes	50% ,,
Wages	12% ,,

Increased War Costs

Owing to the steadily increasing output of gas and to the improving financial position of the Undertaking, it has been possible to carry these increases and even to reduce the price of gas. With added war increases particularly in the price of coal, labour, and gas oil, and the substantially reduced output of gas, this is no longer possible. The increased charges to be met would have the effect on the basis of a normal year's output of increasing costs, as compared with 1934-35 when the present gas rates were fixed, by about £160,000 made up as follows:

	Per cent. Increase compared with 1934-35.	Amount.
Coal	40	£80,000
Gas Oil	85	5,000
Appliances and Materials	25	30,000
Wages	20	25,000
Income Tax	36	8,000
A.R.P.	—	12,000
Total		£160,000

These increases in costs over the period of six years have been and will be largely offset by higher prices for coke, reduced interest and sinking fund charges, improvements in production and by economies arising from war conditions such as lower coal consumption and reduced staffs, but there still remains the loss in revenue from the fall in gas consumption, amounting to some £68,000, corresponding very nearly with the estimated deficit of £64,855, which, together with the current year's deficit has to be met by the proposed increase in the price of gas. The current year's deficit may be in the region of £30,000. The following is the scale of charges which it is proposed should be introduced at May 1, 1940:

CITY AREA.

ORDINARY METERS.

Consumption over a period of approx. 3 months.	First 5,000 cu. ft.	Remainder.
Consumption up to 5,000 c.ft.	3s. 4d.	—
Over 5,000 and up to 100,000 c. ft.	3s. 4d.	2s. 9d.
,, 100,000 ,, 250,000 c. ft.	3s. 4d.	2s. 6½d.
,, 250,000 ,, 500,000 c. ft.	3s. 4d.	2s. 4d.
,, 500,000 ,, 750,000 c. ft.	3s. 4d.	2s. 2½d.
,, 750,000 ,, 1,000,000 c. ft.	3s. 4d.	2s. 1d.
,, 1,000,000 ,, 10,000,000 c. ft.	3s. 4d.	1s. 9½d.
,, 10,000,000 ,, 15,000,000 c. ft.	3s. 4d.	1s. 8½d.
,, 15,000,000	3s. 4d.	1s. 7d.

SLOT METERS.

Consumption up to 5,000 c. ft.	3s. 6d.	—

Remainder as ordinary meters.

OUTER AREAS.

The same actual increase per 1,000 c.ft. as City Area.

CONTRACT RATES FOR SUNHOT WATER HEATERS.

To be increased by ½d. per day to 3½d., 4d. and 4½d. per day, according to size of heater.

Amendment of Hire Policy

These increases will take effect on all meter readings taken after the beginning of the summer survey on or about May 1, 1940.

The proposed increased price of gas will yield about £80,000 per annum, but is barely sufficient to wipe out the deficit in a reasonable time having regard to possible further increases in costs. It is proposed, therefore, to make a departure from the policy pursued by the Department since 1912 of supplying cooking appliances on free loan, by charging a nominal rental of 1s. per quarter on all gas cookers, hotplates, and oven burners. This proposal is estimated to yield a revenue of £7,000 per annum, but it is intended to be more than a revenue yielding expedient.

We are experiencing at the present time an acute shortage of these appliances, largely because consumers are reluctant during war time to spend money on the purchase of appliances of their own. It seems probable, therefore, that the Department will have to incur capital expenditure in the purchase of additional appliances of the free loan type, and as you are no doubt aware the Treasury has placed severe restrictions on borrowing for capital expenditure.

This rental charge will ensure that no appliances will be retained in consumers premises unnecessarily (as they not uncommonly are) and will make the maximum number available to consumers who really need them yet cannot afford to buy cookers of their own.

The effect of these proposals will be to increase the gas bill of the average household consumer by about 2d. per week, or 3d. per week where the cooking appliance is supplied by the Department, and these increases cannot be considered excessive having regard to the much greater increases in the prices of coal and other household necessities.

It is hoped these proposals will permit of the price of gas being held stable for at least a year and so avoid frequent changes in price which are irksome to the consumer and costly in administration.

Manchester District Association of Gas Engineers

The 70th Annual Meeting of the Association was held at the Midland Hotel, Manchester, on Friday, March 29

Mr. W. T. Hainsworth, Engineer and Manager, Newton-le-Willows, was inducted as a new member of the Association.

The work of the Lancashire and Yorkshire Commercial Sections was reported, and it was stated that there had been a good attendance at all the meetings.

The members stood in silent token to the memory of Mr. W. J. Smith, B.Sc. (Bolton), who became a member in 1915, and was President in 1930. For a number of years he was also Chairman of the Lancashire Commercial Section.

Recommendations of the Committee

The following Recommendations of the Committee were adopted unanimously :

(*a*) That a donation of 10 guineas be granted to the Benevolent Fund of The Institution of Gas Engineers.
(*b*) That Mr. T. Reynolds, Stockport, be appointed the Association's District Member on the Council of The Institution of Gas Engineers.
(*c*) That Messrs. T. Reynolds and J. E. L. Cooper, Yeadon, be appointed Representatives of the Association on the Councils of the Manchester and District, and Yorkshire Junior Gas Associations respectively.
(*d*) That Messrs. C. H. Bamber, A. L. Holton, T. Reynolds, and F. G. Shaw be appointed Representatives of the Association on the Lancashire District Gas Education Committee.
(*e*) That Messrs. H. Burton, J. Corrigan, G. E. Currier, and H. Singleton be appointed Representatives of the Association on the Yorkshire District Gas Education Committee.
(*f*) That Messrs. L. W. Harrison and R. N. Webb be appointed Representatives of the Association on the Barnsley Advisory Committee of Coke Oven and Chemical Work.

Induction of President-Elect

The retiring PRESIDENT, Mr. H. Singleton, then inducted Mr. T. Reynolds into the Presidential Chair. In doing so, he said that Mr. Reynolds had been a member of the Association for ten years, and had been a very active member of the Council. He was the Association's representative on the Manchester Junior Council, and took a great interest in the Lancashire Education Committee. He had presented a very valuable Paper on "The Distribution and Organization of Sales Departments," four years previously, and was a very enthusiastic gas engineer, and one who would serve the interests of the Association very well indeed. He trusted that Mr. Reynolds would have as happy and as successful a year as he, the speaker, had enjoyed.

Mr. T. REYNOLDS was then invested with the Presidential Badge, and in returning thanks for the honour which had been paid him, invested the retiring President with the past-President's Badge.

Alderman J. T. LORD, Chairman of the Stockport Corporation Gas Committee, extended a hearty invitation to the members of the Association to visit Stockport in July. He congratulated Mr. Reynolds on his appointment as President.

The PRESIDENT, in returning thanks for the congratulations which had been offered to him, said he had also received congratulations from the Eastern Counties Engineers' Association, and Mr. F. Johnston, Secretary of the Manchester and District Junior Gas Association, for which he tendered his sincere thanks. He also wished to take the opportunity of congratulating Mr. E. Astbury, M.I.Mech.E. (Liverpool), upon his installation as President of the Liverpool Engineering Society.

Presidential Address

Mr. Reynolds then gave his Presidential Address, which will be found on other pages of our issue to-day.

Mr. J. E. L. COOPER, Senior Vice-President, in proposing that a hearty vote of thanks be accorded to Mr. Reynolds for his Address, said that it was an epitome of great work well and truly accomplished; work of which any gas engineer might be proud. The description of the work bore evidence of careful forethought and sound reasoning in the selection of one scheme as compared with another. Mr. Reynolds was to be heartily congratulated upon being able to maintain such a low figure of capital expenditure; it augured well for the future success of the Stockport Gas Undertaking. It was a source of satisfaction to find Mr. Reynolds advocated the establishment of coke-selling schemes, especially at the present time.

Mr. A. MACKAY, Junior Vice-President, seconded the vote, stating that the Stockport Corporation were to be congratulated on having a very good works appearing at a very low capital cost on their books.

The vote was carried unanimously.

The PRESIDENT, in responding, hoped that copies of his Address would be kept for reference by the members for their visit to Stockport in July, as some of the points dealt with would be more clearly understood by visual inspection.

Presentation of Volumes of Transactions

On behalf of the members of the Association, the PRESIDENT thanked Messrs. R. & J. Dempster, Ltd. (Manchester), for presenting to the Manchester Public Libraries bound volumes of the Transactions of The Institution of Gas Engineers from its inauguration in 1865 to 1902. These volumes were available for reference at the Manchester Central Library.

Mr. J. WINSON SCOTT, Managing Director, Messrs. R. & J. Dempster, Ltd., suitably responded.

Votes of Thanks to Committee and Officers

Mr. JAMES CARR (Stretford) proposed that a vote of thanks be accorded to the Committee and Officers of the Association for their services during the past year, and paid special tribute to the work done by the Hon. Secretary, Mr. H. Burton.

Mr. R. L. GREAVES (St. Helens) seconded the vote, which was carried unanimously.

The HON. SECRETARY, responding to the vote, said both the Committee, Officers, and himself, had two incentives to do their best for the Association—their love of the Association and their keen desire to support the President. He would assure Mr. Reynolds, on behalf of the Committee and the other Officers, that he would receive their full and hearty support during his term of office.

THE ASSOCIATION LUNCHEON

The Annual Luncheon of the Association took place at the Midland Hotel, prior to the meeting.

The PRESIDENT (Mr. H. Singleton), in proposing the toast of "Our Guests," said that 12 months ago when the Association paid him the honour of making him its President he little thought that more than half his year of office would be held under war conditions. The country had now been at war for seven months, and many of them who experienced the control of a gas undertaking during the so-called Great War were able to compare conditions then with this war, so far. A far closer control of all raw materials was being exercised than in the previous war. Production, repair, and maintenance on gas-works were rendered much more difficult. But, as had been shown during the recent severe spell of wintry weather, the Gas Industry could "deliver the goods," and was continuing to deliver a diversity of products to help to win the war. The chief grumble was on the question of coal supplies, which was a tangle which ought by now to be straightened out, though this was far from being the case. The accumulation of stocks at gas-works was an imperative necessity in these times, and the Mines Department should see that this was accomplished at the earliest date.

They were now celebrating the 70th birthday of the Manchester District Association of Gas Engineers, and they were very pleased to welcome in their midst Mr. George Dixon, the President of the Institution of Gas Engineers, a past-President of the Association, and also Dr. Braunholtz, the Secretary of The Institution of Gas Engineers. The Institution was doing a great deal of work in connexion with the war activities of the Gas Industry, and was actively assisting the Government with its experience and research work, and in these matters the Institution was ably guided under the Presidency of Mr. Dixon. They were also pleased to welcome Dr. Townend, the Livesey Professor at Leeds University, who was successively co-ordinating the scientific and industrial interests of the Gas Industry in collaboration with the newly-formed Gas Research Board. He, the speaker, had read with great interest Dr. Townend's report of the activities of the Coal, Gas and Fuel Industries Department.

There was also present Alderman J. T. Lord, Chairman of the Stockport Gas Committee, and they were also pleased to welcome the Press, especially Mr. Norman S. Smith, the Technical Editor of the "GAS JOURNAL," who was making his first visit to the Association.

There was a member of the Association present whose name he would like to mention, although he was not a guest. He had been a member of the Association for very many years, and he extended a hearty welcome to Mr. T. H. Poulson, of Stafford.

Threshold of Greater Progress

Mr. GEORGE DIXON, in responding to the toast, said he was very grateful to the members of the Association for the support they had accorded to him during his year of office as President of The Institution of Gas Engineers. As indicative of that assistance, he might let them into a secret. Of five Papers which had been arranged for the meeting in June, in London, no fewer than four of them were to be read by members of the Association. They were papers dealing with subjects which would be of the greatest interest to the district covered by the Association. He hoped as many members of the Association would attend that meeting as possible, when they would have the pleasure of seeing Sir Frederick West installed in the Presidential Chair.

The Gas Industry seemed to be now on the threshold of a progress which would prove to be greater than anything it had experienced in the past. He had been privileged to see a great deal of the work that was being done, and speaking as a general practitioner, and not a specialist, it was perfectly apparent that something was likely to be achieved which would be greatly to the credit of the Industry in the future. One would like to be a little more definite and say what kind of work was going on, but as he had stated at a luncheon of the Association earlier in the year it was deemed advisable not to mention all of it. It was for that reason that some of the reports which had been brought out on the research side had not been made public; but the day would come when they would be told what the Industry was doing now; not only what it was doing towards furthering prosperity in times of peace but also what it was able to do as a contribution towards finishing the war and bringing it to a successful conclusion. They were all supplying gas, and working up by-products, and the main object to-day was to supply gas to munition factories in order that they might turn out the very best munitions possible, and as speedily as possible. With regard to the question of coal supply, he did not wish to say a great deal, but only to appeal for what he would term goodwill. He had had occasion to speak to officials of the Mines Department up and down the country, and indeed only the previous afternoon he had had an interview with two gentlemen of high standing. He was satisfied that goodwill existed. He admitted that yesterday afternoon he did not get the answers to the questions as satisfactorily as he would have liked to have had them; nevertheless, a spirit of goodwill was exhibited. The relations between the Institution, the Industry and the Government Departments concerned had been very cordial indeed. He could only express the hope that if the Government had Orders to frame, or laws to enforce, they would first of all consult the members of the Gas Industry who knew their job thoroughly. And who would give them every possible assistance.

He would like to express his good wishes to the President-elect, Mr. T. Reynolds, for his success and happiness during his forthcoming year of office. In doing so he would also like to give him a message from the people at Nottingham who still claimed Mr. Reynolds as a Nottingham product, and wished to express the pleasure they felt at his being elected to a position he so richly deserved.

Development of Work at Leeds

Dr. D. T. A. TOWNEND, also responding to the toast, was particularly grateful for the contacts he had been able to make through the medium of the Association, and he would particularly like to mention Mr. C. S. Shapley, of Leeds, and Mr. D. M. Henshaw, of Huddersfield. He thought many of those present knew that he hoped to develop work in Leeds in the closest possible contact with the Gas Industry. It had always seemed very surprising to him that Universities had not provided the technical training directly for industries that they might have done. If one looked at the Oxford Dictionary for a definition of industry, one definition would be found to be, "habitual employment in useful work." So that all University training was primarily a preparation for industry in its broadest sense; whether it be for medicine, the law, the Church, commerce, or the professions in general. Probably many professional gentlemen would not like to be termed industrialists, but, in fact, that was what they were. In University work, without the industrial side, pure scientists had often been so engrossed in the minutiæ of their own studies as to remain quite oblivious of the fundamental problems which practical affairs disclosed. Those engaged in industry, in its widest sense, had such problems brought to their notice. The discovery of many scientific principles had been the result of investigations of practical problems. He might remind his hearers of some of them which they might have known but had probably forgotten. There was Lavoisier's discovery of the principles of combustion as the outcome of his investigation of street-lighting in Paris. The science of thermo-dynamics, which arose from a study of the efficiency of steam-engines; bacteriology was based on Pasteur's study of brewing, while biochemistry had grown around the study of the problems of physiology, nutrition, and agriculture. Coming to recent times reference might be made to "knock" in internal-combustion engines. By quite an accidental industrial discovery the scientific understanding of the function of anti-knocks was given a great impetus, and this had a great effect upon the study of kinetics and of gas reactions. Therefore, it was most important that a University education should be very closely linked-up with the problems of industry.

It was very pleasing to be able to record that the opening of industrial departments, and the recognition of the need for University teaching in industrial affairs, was first established at Manchester and Leeds at about the same time, and, he thought, within a short interval in London at the Imperial College.

Probably his hearers would like him to say something about the work done at Leeds. There were four ways of looking at any subject. First, one could praise it; secondly, one could condemn it; thirdly, one could damn it with faint praise; and fourthly, one could praise it with faint damns. He expressed the loudest praise for the research work done at Leeds in connexion with the Gas Industry, and also for the workers who were carrying it out. That work had now been going on for some years. He would like also to pay tribute to his predecessor, Professor Cobb, for the way in which he selected, on behalf of the University, men of the very finest calibre to do that work; because if the right men were not selected then much progress could not be made.

There were some first-class research brains in the Gas Industry, and the formation of the Gas Research Board should help to secure the wider planning of research work. As a large consumer of the coal resources of the country the Gas Industry would no doubt still further continue to establish itself as a major chemical industry, and should take a leading part in its post-war development. He thought that they all agreed they must plan actively to meet post-war conditions.

Results at Torquay and Paignton

The Directors of the Torquay and Paignton Gas Company express their gratification at being able to report continued expansion in the demand for gas; an increased sale during 1939 of over 12,000,000 cu.ft. having been recorded, despite the regulations affecting gas sales and public lighting. The actual number of therms sold was 3,661,965. The balance of revenue carried to Profit and Loss Account is £22,941, against £19,456 a year ago. The dividend recommended is at the full rate. During the year £50,000 of 4½% redeemable debenture stock was issued.

All-Gas Cottage Flats

James Forrester Describes a South Wales Housing Experiment

Shortly before the war the first stage in a small but unusual housing experiment was completed at Trevethin, Monmouthshire, by the Eastern Valley Subsistence Production Society. The Society came into being early in 1935, to enable older unemployed men to raise their standard of living by producing co-operatively, for their own use, as many of the essentials of life as possible. Within two years a very wide range of essential foodstuffs and other commodities was in regular production and being supplied to members only at prices below the ordinary retail figure.

In planning the accommodation at Trevethin the Architect, Mr. J. Fogden, A.F.A.S., and the Society's Dietitian and Domestic Consultant, Miss E. A. Nicholls, were asked to satisfy certain conditions, among them being that gas fuel should be used exclusively for all purposes.

Materials for the whole block of four flats cost approximately £1,150, a figure above that allowed for, but providing for unusually good equipment.

The gas fittings include in each flat a flush 9-radiant fire in the living-room with brick surround, a gas point in all other rooms for portable fire or other apparatus, a "New World" cooker, a Radiation multipoint heater (giving instant hot water for bath, lavatory basin, and kitchen sink at all hours), a linen cupboard heater, and globe lighting in each room with Webson switch ignition. The only items left for the tenant to buy or hire are the gas washing machine, for use in the kitchen, and a portable fire.

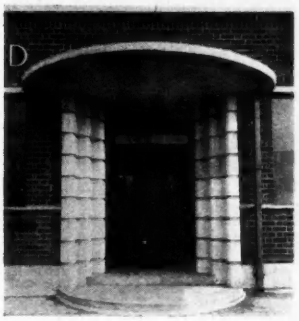
Except for the linen cupboard heater (a most useful device and very economical) and the washing machine, the whole flat runs without a match, as each piece of apparatus is self lighting; gas lighting by switch has given satisfactory service during the first six months of its life.

The flats have been inhabited now since September, 1939, and the tenants speak of them in terms of the highest praise. None of them wishes to go back to a coal fire; on the contrary, the convenience and homeliness of gas are greatly appreciated. The fire in the living-room is a boon in the early morning, allowing the working husband (who normally does the grate) an extra 15 minutes in bed. Visitors comment on the comfortable warmth that this one fire seems to impart to the whole flat. The gas lighting is excellent and, where halfpennies count, is appreciated the more because it helps to warm the rooms. The four flats were let on the outbreak of war to four families connected with the Society, two of them industrial wage-earners at 12s. each per week, one an unemployed family at 6s. a week (the standard rent for the district under the Means Test) and one an agricultural worker at 3s. 6d. per week (the figure fixed by the local Agricultural Wages Board), all these rents being inclusive of rates. The fact that £1,000 was given towards the cost of the building meant that these basic rents could be charged experimentally.

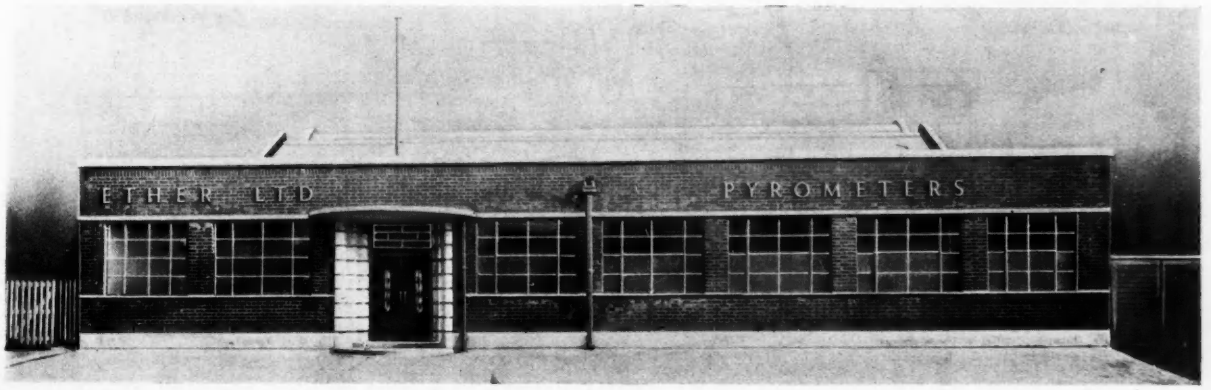
The Society buys gas and water at bulk rates from the Pontypool Gas and Water Company, without whose willing co-operation the flats would not have been built. The gas meters are owned by the Society, who charge 3s. per 1,000 cu.ft. for gas and water used (experience shows that this figure covers costs). A member of the Society's staff collects the rents as well as the money from the meters and the privacy of the home is therefore invaded only by one collector instead of by the usual three or four (rent, gas, electricity, rates). The Gas Company, at the same time, only has to render one monthly account for all dwellings connected to their bulk meter, and (as the gas meter is fixed in the two-way cupboard between living-room and kitchen) the Society's rent-collector when she calls has access to either of the two most important rooms in each flat and a natural opportunity to talk to the housewife in her own home.

Now that the housewives have become accustomed to all-gas housekeeping, the cost for gas to them is very moderate, averaging 4s. 6d. to 5s. 6d. per week during the winter months plus the hire of gas washer and portable heater. Comparable figures for new Council House accommodation in the South Wales coalfield would be, at a minimum, 2s. per week for coal (assuming a ton every ten weeks at 20s. per ton), 1s. 6d. per week for electric light (three units at 6d. each), 6d.-1s. per week for gas for early morning tea, ironing, occasional cooking, &c. (gas at 4s. 10½d. per 1,000 cu.ft.). In the all-gas flat the summer figure is certain to be lower than 4s. 6d. per week, as the living-room fire will not have to burn throughout the day. Furthermore, an all-gas home means markedly less cleaning and dusting, a copper or two less per week for cleaning materials and blacklead, considerably less frequent decorating, no grates to "do" and consequently much more time in bed in the morning, no ashes, no smoke, no chimneys (asbestos or Nautilus flues were used throughout at Trevethin), less weekly washing, no carriage or storage of fuel, more space inside the home and immediately outside, no roads (less cost, less noise, less dirt, less danger).

New Birmingham Works of Ether, Ltd.



ETHER, Ltd., of Tyburn Road, Birmingham, have just removed to their newly constructed works distant only some few hundred yards from their old address. This Company was registered in 1923 when it occupied premises at Park Road, Aston, Birmingham. Growth of the business necessitated removal in 1932 to larger premises at Tyburn Road, and further development made it necessary to build new premises covering an area of some 8,000 sq. ft. at their present address. The Company manufacture scientific instruments, including pyrometers, automatic valves (electrically and pressure operated for remote control of gas supply), electrically and pressure operated safety devices for the safeguarding of combustion systems using air pressure or gas, thermostats and automatic temperature controllers for gas-fired furnaces and hot air circulating furnaces for precision heat treatment operations. A feature of the new works is the special construction of the Laboratories wherein both floors and ceilings are especially treated to avoid settlement of dust. The Company are at present engaged largely upon the manufacture of automatic controllers and recorders for use in the heat treatment of Duralumin for aircraft work.



Manchester District Association of Gas Engineers

Presidential Address

of

THOMAS REYNOLDS, M.Inst.Gas E.,

Engineer and Manager of the Stockport Corporation Gas Department

Presented at the Annual Meeting of the Association held at the Midland Hotel, Manchester, on Friday, March 29

THE PRESIDENT

Mr. T. Reynolds commenced his career with the Nottingham Gas Department in 1908. During the Great War he served for four years in the Army and received a commission in the Royal Engineers. He was appointed Second Assistant Gas Engineer to the Stockport Corporation in 1921, and Deputy Engineer and Manager to the Blackpool Gas Department in 1925. He received his present appointment of Engineer and Manager to the Stockport Undertaking in 1930.

AT the outset, it is my duty to thank you very sincerely for electing me your President. When I review the long and distinguished list of my predecessors, and remember the high traditions of this Association, I realize that you have conferred on me a signal honour. My year of office is clouded by the catastrophe of war; nevertheless, at this time, when restrictions are placed on the publication of technical developments, the functions of our Association can fulfil extremely useful purposes by the free interchange of ideas between members, and the pooling of experiences which have particular importance when connected with work essential for the prosecution of the war.

The work of a gas engineer to-day bears very little resemblance to that of his predecessors. The numerous Acts and Orders, the provisions of which it is essential for him to put into operation, make him principally an administrator. Therefore, rather than speak on any one specialized subject, I intend to give a resumé of the situation at Stockport at the time of my appointment as Engineer and Manager in 1930, the rearrangements and extensions I have since carried out, and the more interesting details involved in the latter, in the hope that the record of some of the work done will be of use to the members.

You will appreciate that many of the more recent experiences of working under wartime conditions in the Industry have had to be eliminated from this Address in order to comply with the Board of Trade Orders under the Defence Regulations.

Stockport Gas Undertaking, 1930

For five years prior to 1930 the output of gas had remained fairly constant, with only a slight tendency to increase. There was, however, a large potential industrial load within the existing area of supply. In addition, districts to the south were being rapidly developed as residential areas, and if these districts were incorporated in the Stockport statutory area there was the prospect of a substantial increase in the domestic load.

The gas-making plant consisted of two installations each of twenty-four 76 in. downwardly-heated continuous vertical retorts, arranged in benches of twelve and capable of producing 4½ million cu.ft. of gas per day. The gas produced from both installations was collected into a single foul main and passed through the condensers, exhauster, washing plant, purifiers, and meter in one stream. The nominal capacity of the ancillary plant was 3 million cu.ft. per day. A storage capacity of 4 million cu.ft. was available from two water-sealed holders which were of the column and rope-guided type. Both these holders were old, and not in a very satisfactory condition.

A part plan of the works at this time is shown in Fig. 1.

While the carbonizing plant was large enough for the time being, and would indeed meet possible increases in output for some years, the ancillary plant was too small to deal with the gas required to meet the existing winter load, and gave rise to back pressure difficulties. Furthermore, it will be appreciated that the gas produced by the two retort installations could not be separately metered and tested.

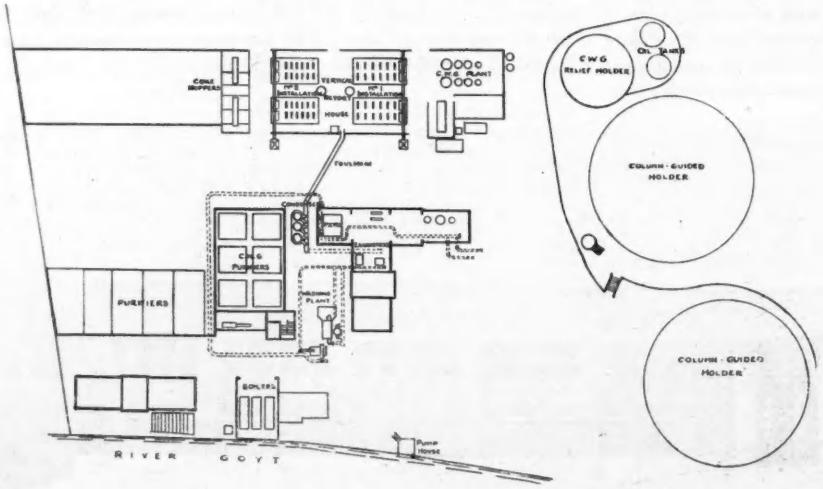


Fig. 1—Part Plan of Portwood Gas Works, 1930

Extensions and Re-arrangements of Plant

Having the advantage of 3½ years' previous experience at Stockport, I had confidence in immediately submitting a report to my Committee setting forth these conditions, and advising them on the necessity for extensions and re-arrangement of plant.

It was recommended that a new M.A.N. waterless holder of 3 million cu.ft. capacity should be installed, followed later by a spiral holder of 2 million cu.ft. capacity replacing the older of the column-guided holders, and built in the existing tank.

Two alternative schemes were considered for enlarging the washing plant:

(1) To install a complete new plant large enough to deal with the gas output from the existing and possible future carbonizing plant.

(2) To duplicate the existing plant and to divide the retort house production into two streams, each stream being dealt with separately and joined after metering on the main inlet to the holders.

The advantages of the second scheme were:

(a) The existing plant could be used again.

(b) When the scheme was completed, ancillary plant would be available to treat an increase in output for many years.

(c) During the summer, the reduced output could be dealt with by one set of plant, enabling the other to be shut down for cleaning and overhaul.

(d) Facilities would be given for separate testing and metering of the gas produced by either installation of retorts, thus assisting in the control of these plants.

Order of Urgency

The alterations and additions necessary to carry out this scheme were therefore proceeded with, the programme being arranged to deal with items in order of urgency.

One unit comprising a Livesey washer, P. & A. tar extractor, vertical centrifugal washer, and a final rotary brush washer was first installed, while the existing plant remained in service. When complete, the new unit was put to work, and the scheme completed by the erection of the second unit in which the existing plant was utilized and re-arranged.

The valves and connections were designed to allow the gas streams to pass through either unit of plant as desired.

Then followed a duplicate set of four overhead oxide purifiers each 55 ft. by 30 ft. by 5 ft. deep, arranged alongside the similar existing set. U-type water sealed valves were included on account of the very satisfactory experience with this type on the first set.

Two Connersville station meters were installed at the same time, so that at this stage of reconstruction the gas could be divided into two streams after the exhauster.

To make room for duplicating the condensers, it was necessary to dismantle an old station meter and house. The second set of water tube condensers was then installed, together with an exhauster, and with the additional foul main from the retort house this work completed the formation of the two streams.

Incidentally, while this reconstruction had been in progress, attention had been given to various works mains connecting the different units, and these had been renewed and enlarged where necessary. Advantage was taken to arrange for the exhausters, compressors, meters, and station governors to be housed in one building so that they would be under the constant supervision of one attendant.

To give improved conditions in the distribution system, a gas dehydrating plant was installed on the main inlet to the holders. This plant is capable of treating the maximum make, and with the main storage holder of the waterless type, full advantage is taken of the process as there is no possibility of resaturation.

The existing sulphate of ammonia plant had not been operated for some time, due to the market prices of this by-product, and to relieve the situation with regard to the disposal of liquor the plant was re-modelled to produce a concentrated liquor. The plant is automatic in operation and no labour is required except for periodical inspection.

Fig. 3—Stockport Area of Supply, Districts added since 1930 shown shaded

After careful investigation into the economics of benzole production, a plant was installed and placed prior to the dehydrating plant. This plant is capable of extracting up to 2½ gallons of crude benzole from each ton of coal carbonized.

So that the effect of benzole extraction and dehydration can be accurately determined, a Connersville meter has been placed on the outlet of these plants, and before the gas passes into storage.

We have therefore the benefit of measurement of the gas before and after dehydration and benzole extraction.

Fig. 2 shows a part plan of the works at the present date.

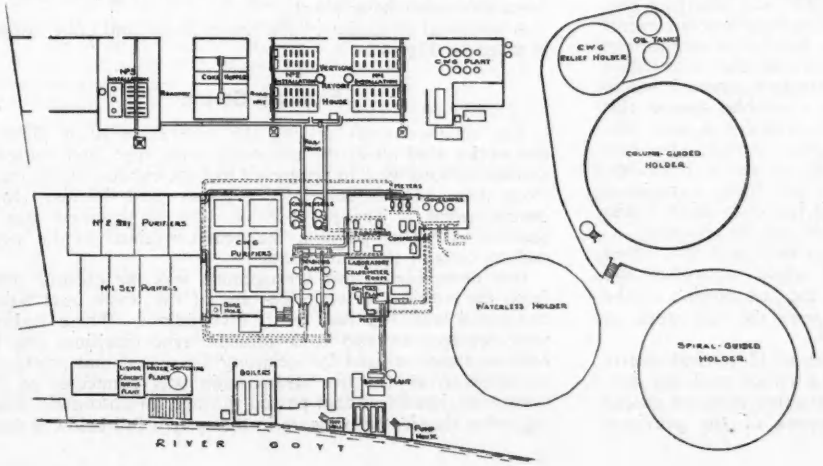


Fig. 2—Part Plan of Portwood Gas-Works, 1940

Carbonizing Plant

The first vertical retort installation consisted of 24 downwardly heated retorts arranged in two benches of 12 retorts, each bench being capable of producing one million cu.ft. of gas per day. This installation was erected in 1920, and in 1925 two further benches of 12 retorts each were erected. No. 2 Installation had a capacity of 2½ million cu.ft. per day.

Minor repairs from time to time had been carried out, until in 1934 No. 1 Bench was reconstructed to upward heating, and No. 2 Bench was similarly reconstructed in 1937.

By adopting upward heating, improved output was obtained, so that whereas the normal output from the two benches had been 2 million cu.ft. per day, it now amounts to 3 millions.

No. 2 Installation retorts erected in 1925 are being similarly treated, and when the whole plant has been reconstructed, the output from the two installations will be increased to over 6 million cu.ft. per day.

After six years of vigorous sales organization in the industrial and domestic fields, the output was steadily raised, the increase averaging 6% per annum. The area of supply was also being extended, making future expansion of sales highly probable.

The growth of the area is indicated by the diagram on Fig. 3.

Area of supply in 1929: 27.1 square miles.

Area of supply in 1940: 41.5 square miles.

An extension of the carbonizing plant was receiving preliminary consideration when the turn in international events gave rise to apprehension. I therefore decided to recommend to my Committee that, as additional carbonizing plant would undoubtedly be required in the not far distant future, it would be advisable to have reserve plant available should this country become involved in hostilities. Even if it were possible to instal new plant during the war period, the cost would rise considerably and remain high for years afterwards. My predecessor unfortunately had a very bitter experience during the years 1914-18, and with this lesson in mind it was my intention that the experience should not be repeated.

My Committee was in complete agreement, and sanctioned the erection of a complete new retort house, messroom, and coke screening plant, and fortunately the last portion of the contract was completed and put to work the first week in September last.

This installation consists of one bench of 12 vertical retorts having a nominal working capacity of 1½ million cu.ft. per day.

New messrooms and cloakrooms, together with an extension to the existing coke storage hoppers of the previous installation, with coke screening plant, were included in the contract, and these are situated between No. 2 Installation and the new No. 3 Installation.

By this arrangement the coke hoppers and screening plant are centrally situated, and the coke from each bench is elevated in gravity bucket conveyors to the screens.

Recent years have seen a large increase in the quantity of coke sold in bags, and the existing hoppers had been found inadequate to cope with the orders received. The enlargement of these hoppers was, therefore, a necessity, and additional facilities for filling the bags and loading them on to vehicles were included in the scheme. A debreezing screen has been installed under the hoppers. This can be moved to the outlet of any compartment, and enables dust-free coke to pass into the weighing machine to which the bagging apparatus is attached.

The coke screens erected in 1925, when the hoppers were first installed, were of the rotary type with perforated steel plates, arranged to give six grades of coke. They had given good service, but extensive renewals were becoming essential. They have now been replaced by vibrating screens to give better grading and at the same time reduce the maintenance costs. The grading plant consists of two double decked screens with a band conveyor between. These screens produce five grades of coke, the largest size being extracted first.

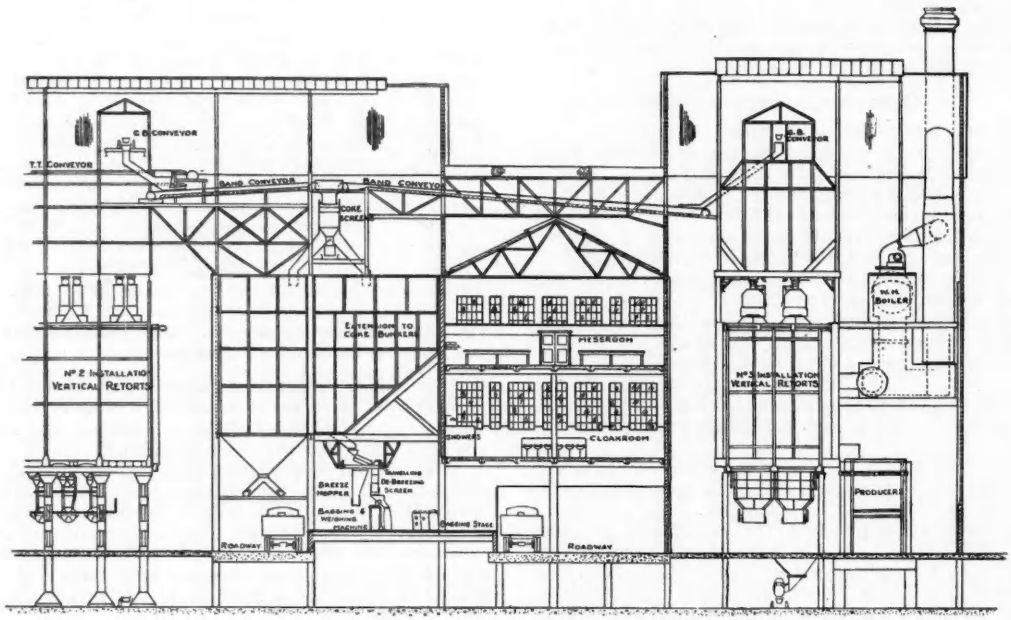


Fig. 4

The plant can deal with the whole of the coke discharged from the carbonizing plant.

A sectional elevation of the retort house and coke hoppers is given in Fig. 4.

Exhaust Steam

The steam engines driving the several units of plant in the works were all of the non-condensing type, and while the reconstructions were in progress I had the exhaust steam mains from these engines connected together and brought to a central point. The purpose of this arrangement was to recover as far as possible the heat contained in the steam and to reclaim the condensate.

One exception to this arrangement was the exhaust steam from the turbines driving the fans of the waste heat boilers connected with the two retort installations. These turbines were replaced by two back pressure type machines and the exhaust steam utilized for steaming the retorts and producers. A supply from the live steam main was connected to this system so that live steam passed through an automatic reducing valve should the pressure in the system fall below a deter-

mined figure, due to an insufficient supply, or when a turbine was not working.

The remaining exhaust steam was collected into two separate lines of mains, one main gathering the exhaust steam from the exhauster engines, and other continuously-running machinery, and the other main the exhaust from intermittent machinery such as gas compressors. The reason for keeping these separate was to obtain as far as possible a constant and even back pressure on all plant. The mains were made sufficiently large to give the minimum back pressure.

The first use made of the collected exhaust steam was to preheat the feed water to all boilers by means of direct contact type heaters. The temperature of the feed water obtained from these heaters was between 190 and 200° F. and the efficiency of steam raising was thereby increased. After the requirements of this duty had been met, a large surplus was still available for other purposes.

The surplus exhaust steam mains—after supplying the needs of feed water heaters—were carried through the purifier house, where they were virtually atmospheric condensers, and also served the useful purpose of maintaining an even temperature in the purifier house. All condensate from these mains is drained into a collecting tank where, after the oil has been separated, the hot water is automatically pumped back into the softened water tank by means of a submerged electrically-driven pump operated by a float switch.

Low pressure live steam had for some time been used on the liquor concentrating plant, and situated nearby was a steam driven pump which worked continuously, raising water from a borehole for part of the works water supply. The exhaust steam from this pump was found to be more than sufficient for the requirements of the concentrating plant, and was therefore adopted for this purpose, thus terminating the use of live steam.

Heating of New Messroom

Due to the success attained by the use of exhaust steam in the various ways previously described, it was natural that when the new carbonizing plant and messrooms became necessary the further use of this steam for providing the hot water for washing and central heating was considered.

The best method of utilizing the steam was not, however, so simple as in previous applications, due to the distance of the proposed messroom from the central point to which the exhaust steam had been collected.

The messroom building is situated between Nos. 2 and 3 Installations of retorts, and consists of two floors above the roadway where vehicles are loaded from the coke bagging stage beneath the coke bunkers. The upper floor is utilized as a messroom with a portion partitioned off into offices for the carbonizing staff.

The lower floor comprises a cloakroom with lockers and racks for employees' clothing, and the washing facilities include a suite of twelve washbowls placed in a central position, with six shower bath compartments nearby. Each shower bath has been fitted with a thermostatically-controlled water mixing valve for blending the hot and cold water and thus delivering water at a constant temperature. The possibility of scalding water leaving the showers is therefore eliminated. The mixer can be set in three positions to give cold, warm, or hot water as required, and is instantly variable. A shut-off and volume control valve is incorporated in the arrangement and is operated after the mixer has been set to give the temperature required.

The scheme finally carried out for the provision of hot water consisted of—

(a) Transferring as much heat as required into an accelerated hot water circulating system by which the messrooms are heated, and

(b) Obtaining from the circulating water, by means of a calorifier situated in the cloakroom, the hot water for washing purposes.

For the primary heat transfer a former feed water heater is utilized. This consists of a steel tank in which a portion at each end is partitioned off by tube plates and connected by a number of tubes. Exhaust steam after passing the boiler feed water heaters is passed through the heater tubes, the correct amount being adjusted by a valve, and afterwards re-enters the exhaust main. The circulating water enters the bottom of the central portion of the heater, passes around the tubes, and leaves at the top. The circulating system is enclosed, as is usual in central heating, but owing to the height which the water has to attain, and the distance required to circulate, an accelerated flow is necessary. Two steam pumps for this purpose are fixed in the engine house of a rotary washer near the heater. A circulating water temperature of 200° F. is easily obtained, and by lagging the flow pipe up to the cloakroom the temperature obtained in the circulating system of the messroom and cloakroom is ample for the purpose.

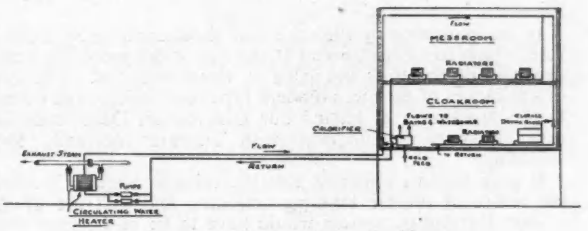


Fig. 5—Diagram of Heating System for Messroom

From the flow pipe immediately after it enters the cloakroom a branch is taken to the calorifier for providing hot water for washing purposes. Valves are placed in the services so that the flow can be regulated to suit each requirement. During warm weather when central heating is not necessary, the whole of the flow circulates only through the calorifier and thence into the return.

A constant and plentiful supply of hot water is available for the men's use, and although the baths have been used liberally no shortage of hot water has been experienced. A branch is taken from the circulating system for the purpose of supplying heat to a series of clothes drying racks for use in wet weather. These racks consist of double tubular frames upon which the coat hooks are fixed with a hot water coil placed in the centre of each.

A diagrammatic sketch of the hot water system is given in Fig. 5.

At the time of preparing this Address a large lime-soda process water softening plant for supplying the needs of the works boilers is under construction.

To facilitate the reactions, the water to be treated will be first heated up to 180° F. by passing through a direct contact heater situated on the top of the reaction chamber. Exhaust steam will be used for this purpose, and after circulating in the purifier house the exhaust steam will be carried to the softening plant. While there is sufficient for this purpose, I am hopeful that after the plant is in full service, wastage of heat in the form of exhaust steam will be entirely eliminated.

The benefits derived from the wide use of exhaust steam where applicable may be summarized as follows:

(1) Less live steam is used and therefore there is an economy in the amount of water and fuel required for steam raising.

(2) The feed water to the boiler is at a high temperature, giving a larger output from each boiler.

(3) Hot softened water condensate is recovered, resulting in the softening plant having a correspondingly lower load, and less chemicals are used.

(4) The works are in a cleaner state due to the absence of several exhaust steam heads at each position where steam engines are situated.

(5) The works are less visible from the air at night.

(6) The idea of a hot well to collect condensate water is not new, but it is not used as often as may be. The gradual building up of an exhaust steam utilisation system with condensed water draining to a hot well for re-use has proved an outstanding economical success. Once such a system is instituted it helps considerably in the future developments of drains and exhausts in a useful and orderly manner, instead of leaving them to be a haphazard nuisance.

Distribution

The year 1931 commenced with a period of intense activity in the Distribution Department. From 1914 onwards it had been starved owing to the difficult times experienced during

the Great War, and the more difficult times which followed. Plans for reorganization were put in hand, and for better progress the work was sectionalized, each section being brought up to modern standards in turn.

The sales of appliances during the year ended March, 1930, amounted to £8,210, a figure which suggested that some considerable improvement was overdue, in view of the fact that the domestic area of supply had a low proportion of appliances in use. The industrial load had fallen greatly, particularly in the town's staple industry, cotton. Numbers of mills had closed, and a large engineering works, also a gas mantle factory with a consumption of over 40 millions, had been lost as consumers.

In the beginning of 1932 the new showrooms in St. Petersgate, which had been opened at the end of the preceding year, began to demonstrate the value of visual publicity. The sale of appliances of the more modern type rose rapidly, and owing to the precaution of having our Distribution Department in order we were able to deal with increases normally and smoothly.

It soon became apparent that the suburbs were to become the centre of intense building activities, and that the whole of our distribution system would have to be re-designed and brought up to a far higher standard than before.

Unfortunately, Stockport's network of mains was similar to a cartwheel, with a large hub, thin spokes and no rim. It might be considered a simple matter to enlarge the spokes of this imaginary wheel, but when the whole question was carefully gone into, it proved to be a most difficult problem. All the routes by which the spokes could be enlarged or new ones laid were bottle-necked and packed with sub-surface works to such an extent that the cost proved to be prohibitive. This idea was abandoned, and instead it was decided that the situation could best be met by laying high pressure steel mains to carefully selected positions where governors could be erected, the gas to be distributed at about 8 lb. per sq. in. and broken down to district pressure into the existing network. This overcame the problem of thin spokes.

We had now to add the necessary rim to the wheel, so low pressure mains of 10 in. and 12 in. diameter were laid, linking up the governor houses in each district, thus obtaining a kind of turbine effect in this rim.

This has given three great advantages over the low pressure system. In the first place it has reduced the cost of getting an adequate supply of gas to the outer areas where all building operations were being carried out. Secondly, it has enabled us to give a better supply to the outskirts of the town, and, thirdly, it has given us a reserve for further outward extensions. This work was intended to cover a period of five years, but the demand for gas grew so rapidly that the time was reduced to three years.

The normal routine of mainlaying was carried out simultaneously with the aforementioned work, and in the three years preceding March, 1939, we laid some 42 miles of various sizes of low pressure mains.

Some idea of the work carried out during this period will be realized when I say that the sales of appliances reached the figure of £63,000 during the year 1937-38.

Showroom and Publicity

From experience gained after the opening of our central showrooms, I have been convinced that what I call "visual publicity"—*i.e.*, showrooms, are the best method of reaching consumers who are not easily reached by other methods, so to that end we opened three branch showrooms in the outlying areas of Bramhall, Poynton, and Reddish. These have proved their value in the amount of business done. Cookery demonstrations given regularly during the year are always well attended, and certainly create the interest we anticipated.

On the outbreak of war the majority of social functions, amusements, and meetings were immediately curtailed. I foresaw that this drastic step would be detrimental to the life of the community and would particularly affect the associations we had created by lectures and demonstrations in the town. I determined, therefore, to continue with cookery demonstrations and talks in the afternoons in the whole of our showrooms. As a large number of the appliance manufacturers had withdrawn their demonstrators we used our own staff lady demonstrators to maintain the connexion with our consumers.

We advertised war time dishes the first week in September and the result of the attendances was remarkable. Unfortunately, many people had to be turned away from these lectures on account of lack of seating accommodation.

In recent years the demand for a reasonably-priced all-enamel cooker has steadily increased, and by ceasing to supply free or simple hire cookers we have stimulated this demand, by forcing the disappearance of the out-of-date black appliances which were doing much harm to the Industry.

Further, it has reduced the number of maintenance complaints to a large extent. In March, 1930, there were some 12,500 cookers in the district which were loaned free or on simple hire. In March, 1939, these had mostly disappeared, and were replaced by modern appliances to the extent of some 20,288 on hire purchase. Besides these there were the privately owned and completed hire purchase cookers in use. Consequently only 50% of the staff formerly employed on cleaning stoves are now required.

Air Raid Precautions

As you are aware, the most recent legislation affecting the Gas Industry is the Civil Defence Act of 1939, which makes it compulsory for the employees at works, factories, and business premises to be provided with suitable shelter from air raids, and for the employers to report to the Home Office the measures thus taken; also for training and equipping the personnel for fighting fires, rendering first aid, decontamination, &c.

Additional to this, gas undertakings have been required by the Board of Trade to protect their vital plant from the effects of blast and splinters; to purchase spare plant and other materials for effecting temporary repairs should damage occur; to make provision for isolating large mains or districts, and for coupling up adjacent undertakings for the purpose of ensuring a continuity of gas supply.

All these instructions have been carried out in a more or less satisfactory manner, but must vary very widely according to local conditions. Briefly, the measures taken at Stockport include the provision of ten shelters capable of protecting 337 persons. All shelters are in basements; they are brick built with not less than 14 in. walls and reinforced concrete roofs ranging from 9 in. to 16 in. thick.

Premises such as showrooms belonging to the Department have been suitably strengthened with "W" section steelwork and removable steel struts. Seating accommodation has been provided in all shelters, each man having a space allocated to him, his check number being stencilled on the seat to indicate his place, and where, during working hours, his gasmask may be kept. All key men are provided with steel pill-box shelters, and all parties have been equipped with suitable clothing, steel helmets, &c., according to the class of work they have been detailed to carry out. First-aid stations have been provided and parties trained for first aid in accordance with Home Office requirements. The whole works have been re-equipped with fire hydrants supplied from a new water main laid centrally through the works.

As a temporary measure, buildings containing exhausters, &c., were protected by sandbags. It was quickly found, however, that the disintegration of the bags necessitated a more permanent protection. All windows and doorways have now been covered with 14 in. brickwork, and sandbags dispensed with. This method is by far the cheapest in the long run, as the majority of the bricks can be re-used when hostilities cease.

Sixty-six employees normally engaged on mains and services have been trained in anti-gas procedure. They are fully equipped with clothing, respirators, Proto artificial breathing apparatus, &c. Skeleton staffs are stationed at the works on three 8-hour shifts to form a nucleus of main repair parties. This is in conjunction with the Council's A.R.P. scheme.

Coal Handling

In a works without a railway siding, the handling of coal can be very expensive if it is not carried out in a systematic manner. The nearest railway sidings to the works are one-quarter of a mile away, and drops owned by the railway company are rented by the Department at these sidings. Gas Department employees empty all wagons on a piece-work basis into the drops, which hold 400 tons of coal. Three motor wagons convey the coal into the works at the rate of

6 tons per trip. The drivers of the motor lorries are paid a bonus of 3d. per trip over 12 trips, and by doing 15 trips between 7.30 and 11.30 a.m. ensure 270 tons of coal being delivered into the works before noon each day. The motor wagons are then available for delivering coke in the afternoons.

Any daily surplus coal is taken to stack, the motor wagons reversing up an inclined ramp constructed of cross-braced girders on which railway sleepers are laid. A sleeper track is then extended along the top of the coal as the stack develops. The cost of unloading and conveying coal from the drops into the coal receiving hopper, or to stack, is 7d. per ton.

The method of handling from stack when necessary is by means of two mechanical shovels which load the coal into motor wagons. The two shovels together can handle 200 tons in four hours at a cost of 1¼d. per ton.

Mechanical shovels are invaluable to a works situated as Stockport is, particularly in a period of bad weather such as we have recently experienced when no coal was available for several days. These shovels also take the whole of the coke from stack to the screens, and are used for handling the whole of the oxide, rubble, &c.

Coke

The control of coke prices has received more attention during the last few years than any other by-product dealt with in the Gas Industry. District Coke Associations have been very active during the past year, and, speaking for this district, a large number of members, representing 82% of the coke produced, have now joined the Lancashire and District Coke Association. We have not, however, gone far enough in consolidating the position of all producers of both hard and gas-works coke. Unfortunately, we have not yet reached a definite agreement whereby coke shall be marketed at a uniform price in a definite area. Too many loopholes still exist which enable merchants to undercut the present "gentlemen's agreement." No better opportunity than the present time will be forthcoming for reaching a definite agreement incorporating the producers and the merchants on the lines of the Coal Selling Scheme. There is bound to be a shortage of coke during the period of the war, and if this opportunity is not taken now to place the marketing of coke on a proper basis, the gas coke producer will ultimately be in the same position as he was a few years ago.

Financial

The constant thought in my mind during the carrying out of the scheme of reconstructions and extensions at Stockport has been the financial position of the undertaking, and I have endeavoured throughout to avoid the creation of additional burdens. Fortunately, during the carrying out of these schemes certain loans matured. Wherever possible, the staff has carried out a large proportion of the programme, and the costs have been met out of revenue or spread out over several years by the creation of reserve funds.

The net result, I am pleased to say, is that while the total capital expenditure has risen from £882,000 in 1930 to £1,241,000 in 1939, the outstanding debt has only increased from £311,000 to £368,000 over the same period. Expressed per million cubic feet made, the outstanding debt has actually fallen from £270 in 1930 to £267 in 1939.

For the relatively small increase of £57,000 the works have been completely modernized and should now meet normal developments for a good number of years without the necessity of a large capital expenditure.

Company Meetings

British Gas Light Company, Limited

The Two Hundred and Ninth Ordinary General Meeting of the British Gas Light Company, Ltd., was held at the Chief Office of the Company, 2, The Abbey Garden, Westminster, S.W.1, on Wednesday, March 27.—Mr. HENRY WOODALL, M.Inst.C.E. (Chairman and Managing Director), presiding

The SECRETARY (Mr. A. J. Mumford) read the notice convening the meeting, together with the reports of the Auditors. The Directors' Report and Statement of Accounts for the year ended Dec. 31, 1939, were taken as read.

THE CHAIRMAN'S ADDRESS

The CHAIRMAN, moving the adoption of the Report and Accounts, said: This, as you will have noticed, is the 209th Ordinary General Meeting of our Company—at one time we held these Meetings half-yearly—and never have the duties of your Chairman and Directors been more difficult. Many important decisions have to be come to, with little data, on new and unexpected issues, and it is difficult to foresee the results in the near future. There is, however, no need for despondency, and, for many reasons, a few of which I shall give you later, there is justification for the belief in the continued growth and success of our Company and the Gas Industry. We shall not sit down and wait on circumstance but shall keep up our various Undertakings so as to be ready to meet, as far as we can, any emergency.

How gas helps Britain at war is clearly pointed out by the following quotations from speeches, one made in 1918 and the other in this year, 1940:

"Without the direct aid of the Gas Industry," said the Director of Explosives in 1918, "it would have been perfectly impossible for this country to have waged the campaigns of the last three years."

The Minister of Supply, on a visit to a gas-works on Feb. 16, 1940, spoke of the way in which "every ounce, every gramme of value is being extracted from coal, and turned to good use in the Nation's interests."

We have at the moment in course of erection several additional plants for the extraction of benzol, &c., always useful, but never more so than now.

We are always pointing out the value of a ton of coal carbonized as against coal burnt in the raw state, and as far as possible in both our large and small works we are utilizing our raw material to the best advantage. The Authorities appreciate the necessity of keeping us supplied with coal, recognizing that we use it to the best National interest.

Gas Sales

There was a decreased sale of gas in 1939 of 4¼%, which was due to the changed conditions in the latter part of the year. The sale for the first half of the year showed an increase. The reduction at our largest Undertaking was for various reasons heavy, but I am glad to be able to report increased sales at twenty-four of our Undertakings, which served in some measure to offset the decreases experienced at Undertakings adversely affected.

The net profit of the year's working—that is to say, the actual profits earned at the Stations and the receipts from rents, interest, dividends, &c., less the cost of temporary loan and pension fund interest, income-tax, and general charges—was £102,866. The profits at Hull and Norwich included in this net figure fell short, however, by £59,187 of the amounts to which, under the enactments regulating those Stations, the Company is entitled, and we had to draw upon the local reserve funds which, as has been explained in previous addresses and is mentioned in the Directors' report, comprise the accumulation of profits earned in former years in excess of what we term the Parliamentary Interest, and might well be called Dividend Equalization Funds. At the commencement of the last war there was in the Hull Reserve Fund £20,000, but this was rapidly wiped out and there was nothing in the fund from 1916 to 1921. We were then again able to make allocations, and it fluctuated from year to year until to-day it stands at £9,572. At Norwich no fund existed between 1895 and 1931; but in that year we were able to make another modest start with £3,838. This fund at the peak rose to £33,000, and now is used up.

It may be asked—why deplete these reserves at a time like this? The answer is that their sole purpose is to make up such deficiencies in profits, and had the transfers not been made the right to make up the shortage in the year's profits would have been lost.

Increased charges and reduced output experienced at Hull and Norwich in the last year or two have resulted in the respective prices charged for gas at those Undertakings being insufficient to yield the full statutory profits, but while the accumulated reserves showed substantial balances the Directors felt that these ought to be utilized in meeting the deficiencies in profits before any serious increase in the price of gas was made. It will be remembered that a small increase of ½d. a therm was put into force at Hull towards the end of 1938, but this only slightly reduced the rate of depletion of that Undertaking's fund, and the price there and at Norwich has now been increased by 2d. a therm.

Dividend Recommendation

After adding £59,187 from the Station Reserve Funds and the £78,201 brought forward from the last account and meeting interest on debentures and debenture stocks, there was a total of £180,547 available. Out of this sum, £30,000 has been added to the General Reserve Fund, which is thus increased to a quarter of a million pounds—practically the whole of which is invested in gilt-edged securities—and the year's dividends on the preference stocks have been paid, as has also an interim dividend of 3½%, less income tax, on the ordinary stock. From the balance of £94,121 remaining the Directors now recommend that a final dividend of 4%, less income-tax, on the ordinary stock, costing £22,230, should be paid, leaving £71,891 to be carried forward.

This recommendation has been the subject of anxious thought and consideration by the Directors. It is true that we have not actually earned the dividend this year, but the Directors feel that regard must be had to the fact that there is an ample margin available for its payment, and that stockholders have to meet the burden of the heavy increase in the rate of income-tax. Moreover, as will be noted, roughly half of the £59,187 received from the Station Reserve Funds has been added to the General Reserve Fund, and in this connexion the following comparative figures are of interest:

	At Dec. 31, 1930.	At Dec. 31, 1935.	At Dec. 31, 1939.
	£	£	£
General Reserve Fund	125,000	185,000	250,000
Hull Station Reserve Fund ...	85,695	35,925	9,573
Norwich Station Reserve Fund ...	—	28,450	—
Pension and Superannuation Funds	65,575	117,240	160,856
Balance of Profit and Loss carried forward	86,069	88,328	71,891
	£362,339	£454,943	£492,320

It will be seen that the total of these reserves now amounts to nearly half a million pounds and shows an increase of some £40,000 since 1935 and £130,000 in the last decade.

For these reasons the Directors consider they are justified in recommending that on this occasion the usual dividend should be maintained—a course which they think will meet with the stockholders' approval, but it will be appreciated that circumstances may dictate some modification later.

The issue of the remaining £164,414 5½% "B" cumulative preference capital was referred to in the last address to the stockholders, as was also the Special Order in respect of the Fenny Stratford Station, and no further comment is required. As regards the application for a Special Order in connexion with the purchase of the Billingshurst Gas Undertaking of the Horsham Rural District Council which was approved at the Extraordinary General Meeting held at the conclusion of the Annual General Meeting last year, there is nothing further to report as, for reasons which will be well understood, the Board of Trade have not yet been able to deal with this matter.

It will be seen that for the first time the Directors have to report losses at two of the very small Subsidiary Companies. The losses were due to a combination of adverse circumstances, including reduced receipts from residual products and a heavy charge for plant renewals, together with an increase in the price of coal. As is stated, the losses have been met out of the balances of profits brought forward from previous years. The price of gas at these Undertakings has now been increased, as indeed has been the price at most of our other undertakings, and it may be that further increases will have to be made from time to time if costs continue to rise.

Important changes have been made in the management of the Company's two largest undertakings. In the Autumn, Mr. C. R. Armitage, M.Inst.C.E., on the urgent advice of his Doctors and to our great regret, resigned his appointment as Engineer and Manager at Hull, our Chief Station. The Directors felt themselves fortunate in having at Norwich in the person of Mr. A. L. Higham an Engineer whom they could confidently appoint to this important post, and they were also glad to be able to place the Norwich Station in charge of Mr. R. A. Weston, another valued official of the Company, who had for many years occupied the position of Joint Assistant Engineer at Hull. It is perhaps worthy of note that Mr. Higham received his early training with the Company at Hull and Mr. Weston at Norwich, and they have both thus returned to take charge of the undertakings at which they began their careers. It has always been the Board's policy to encourage their own men to fit themselves for posts of responsibility, and I am glad to be able to report that it has been possible to make the important changes above referred to without going outside the Company.

A number of our men are now serving with the Armed Forces, having been members of the Reserves or the Territorials, or having been called up under the National Service (Armed Forces) Act. One hundred and ten men have gone so far, and suitable allowances are, in the case of married men, being made by the Company to assist the wives and children while the breadwinners are away. In cases of hardship the Company is also making allowances to the dependents of single men who have been called up. The time the men spend with the Forces will be treated as continuous service with the Company, and the Directors have no doubt that the stockholders will fully approve the provisions which have been made. Two of our Directors are also on active service, and another has been called upon to undertake exacting and important Government work.

In ordinary times the importance of having young and active Directors in a concern where so much travelling has to be done is great, but in wartime it is hardly an advantage. The three Directors whom we now hardly ever see are still kept in touch with the Company's affairs and only recently we had an excellent report from a Director now at the Front on a matter on which his special knowledge was most valuable.

A Winter of Strain

The winter we have just been through was probably the most severe in the memory of any in this room, and it brought out any weaknesses in our plant and personnel. Both stood up well to the strain. It was a severe strain, however, and especially at the smaller Works. The Officials and workmen underwent considerable anxiety and hardship, and we cannot be too grateful for the excellent work done with very little time indeed for rest day or night. As you know, our works are in groups, and the way help was given one to the other was the cause of great satisfaction to us at the Head Office as well as to those directly concerned.

This bitter weather referred to has brought home to many of us the value of a constant supply of hot water, warmth, &c., which can be obtained by the mere turning of a tap. Those who had the foresight to install gas apparatus throughout their houses suffered no trouble or anxiety about their personal comfort or the possibility of burst pipes, and I am sure this was excellent propaganda for our business.

Gas is being used in an increasing number of trades, new processes, &c. Research work is being undertaken in all directions; never have we had more highly qualified Staffs of Engineers and Chemists who can be consulted by anyone desiring to know the best method of adapting gas for use in special processes. The turning of a tap and obtaining at once the power of known quality is an economic advantage becoming more generally appreciated.

Another point I would urge is the importance from a transport view of having underground this great source of power and heat, helping to save congestion in traffic and wear and tear of roads.

I have tried in the short time at my disposal to give some of the reasons for our faith in our Company and our Industry.

Finally, with regard to the Company, I know of none where the relations all round are happier, and the fact of our having so many undertakings—41 in all—does mean that at periodical meetings of our Engineers, we are able to pool accumulated experience and discuss our own immediate problems to the advantage of the whole concern.

The CHAIRMAN then moved:

"That the Report and Accounts be received, adopted, and entered on the Minutes of the Meeting."

The DEPUTY-CHAIRMAN (Mr. Harold G. Palmer) seconded the resolution, which was carried unanimously.

Dividends

The CHAIRMAN thereafter moved:

"That the payment by the Directors of the dividends of 7% per annum, less income-tax, on the Cumulative Preference Stock and 5½% per annum, less income-tax, on the "B" Redeemable Cumulative Preference Stock, as mentioned in their Report of March 18, 1940, be confirmed."

This was seconded by the DEPUTY-CHAIRMAN and unanimously agreed.

The CHAIRMAN also moved:

"That the payment by the Directors of the Interim Dividend of 3½%, less income-tax, on the Ordinary Stock, as mentioned in their Report of March 18, 1940, be confirmed; and that a Final Dividend on the Ordinary Stock of 4%, less income-tax, making 7½% for the year, less income-tax, be now declared, the same to be payable on April 5 next; and that the Dividend Warrants be sent by post to the last known address of each Proprietor, unless instructions have been received to the contrary."

This resolution was seconded by the DEPUTY-CHAIRMAN and unanimously agreed.

Re-election of Directors

Moving the re-election to the Board of the Viscount Mersey, C.M.G., C.B.E., one of the Directors retiring by rotation, the CHAIRMAN observed that they had had the privilege of having Viscount Mersey on the Board of the Company for a number of years, and he was a most regular attendant at their meetings, his advice and help being greatly appreciated.

The DEPUTY-CHAIRMAN seconded the resolution, which was unanimously carried and briefly acknowledged by the Viscount Mersey.

The CHAIRMAN then moved the re-election to the Board of Mr. E. C. Woodall, the other Director retiring by rotation at this meeting. In doing so, he said that Mr. Woodall had also been on the Board for some years and, as one of their younger Directors, was of great help to them in visiting their works in various parts of the country. He was now serving with H.M. Forces.

The resolution was seconded by the DEPUTY-CHAIRMAN and carried unanimously.

Re-appointment of Auditors

On the proposition of Mr. KENNETH R. MACKAY, seconded by Mr. E. W. THOMAS, it was unanimously resolved:

"That Messrs. Cash, Stone & Company be re-elected Auditors of the Company to hold office until the next Annual General Meeting, and that their remuneration for the year be £600."

On behalf of the Auditors, Lieut.-Colonel W. C. SMITH, D.S.O., M.C., F.C.A., acknowledged this renewal of confidence and spoke of the position of the Company as reflecting the strength of the Gas Industry as a whole.

Vote of Thanks

Capt. W. J. LIBERTY proposed a vote of thanks to the Chairman and Directors for their able management of the business of the Company. It did not require many words, said Capt. Liberty, to express what kind of year the Chairman and Directors had had to face during 1939. The first eight months had been normal and the Directors had been able to carry on their work in the usual way and were, indeed, looking forward to further increases in the consumption of gas. Then, suddenly on Sept. 3 came the news that the country was at war, and from that time conditions became infinitely more arduous—and what would have been a profitable year ended with a decrease of 4½% in gas sales, which he thought they would agree was very slight in the circumstances. There were no fewer than 41 undertakings within the Company, which involved a great deal of travelling on the part of the Directors. Last year had been a very strenuous one, and the Directors had to give great care and thought to maintain the Company in the unique position it had always held in the Gas Industry. For that reason, concluded Capt. Liberty, their thanks should be particularly emphatic on this occasion for the manner in which the Directors had managed the affairs of the Company.

The resolution was seconded by Mr. MACKAY and unanimously adopted.

The CHAIRMAN, in acknowledgment, suggested that this vote should be extended to embrace in addition all the officers, staffs, and workpeople in the Company. Capt. Liberty knew a great deal about the Gas Industry and the work which fell upon Directors, and he was quite right in saying that they had had a trying year. He hoped, however, that the proprietors were satisfied with the way the affairs of the Company had been conducted and with the results which he had told them about that day. He would like to say that those results could only have been achieved through the excellent work of everyone in the Company. They had a very fine staff; and it was a young staff, many of whom had spent all their lives with the Company. Moreover, it was a happy staff who all co-operated together, and it was largely because of this fact that the results were as good as they were.

The SECRETARY, acknowledging the vote on behalf of the staff, said he would be most happy to convey to the Officers and workmen of the Company the thanks of the meeting which had been so kindly expressed and cordially received. No one could have had any doubts as to the loyalty and zeal of the staff, but it had been most gratifying, nevertheless, to see how they had all stood

up to the test of the past months—and it had been a severe test. Only men who were happy and contented could have worked as they had worked, and for that reason credit for what they had done came back in large measure to the Chairman and Directors.

This concluded the business of the Ordinary General Meeting.

EXTRAORDINARY GENERAL MEETING

An Extraordinary General Meeting immediately followed at which a special resolution was passed cancelling Article 85 of the Company's Articles of Association and substituting new provisions in its place.

The new Article relates to Directors' remuneration and expenses incurred in travelling in and about the Company's business, and provides that the income tax on the remuneration shall be paid by the Directors personally instead of by the Company as previously. As the Chairman pointed out, this will effect a saving to the Company, and Mr. H. R. Price, one of the proprietors, in supporting the resolution, characterized it as a patriotic and public-spirited action on the part of the Directors, on which they were to be congratulated.

Radiation Limited

Conservative Financial Policy

Success of New Gas Fires

Wartime Activities

The Annual General Meeting of Radiation Limited was held on Thursday, March 28, at the Incorporated Accountants' Hall, Victoria Embankment, London, W.C. — Sir C. HERBERT SMITH (Chairman of Directors) presiding

The CHAIRMAN, moving the adoption of the Directors' Report and Accounts for the year ended Dec. 31, 1939, said: Before we proceed with the business of this meeting I must refer to the loss we have sustained by the death in June last of Mr. H. M. Thornton, a Managing Director of Radiation, Ltd., since its formation. For the whole of his business life Mr. Thornton was connected with the gas stove industry, and his commercial experience was of great value to Radiation.

From the Directors' report you will have seen that during the year we appointed Dr. Harold Hartley to the Board as Technical Director. Dr. Hartley has been Chief Chemist of the Company and Head of our Research Section for many years past, and his colleagues welcome him most heartily to the Board.

The Annual Report and Accounts for the year 1939, together with the statement showing the combined assets and liabilities of the subsidiary Companies, have been in your hands for some days, and I expect that in accordance with the usual practice you will want to take these as read. (Agreed.) You will, however, wish me to say something about the main items appearing in the accounts.

In the Radiation profit and loss account you will see that the net income from the subsidiary companies for the year and transfer fees and bank interest amount to £133,878, compared with £277,831 for the previous year. This shows a considerable decline in the net income, and the main reason, of course, is that the outbreak of war in September last affected the Company's trading in the latter months of the year which normally are our best months.

I would mention here that it is our practice each year to reserve in the accounts the amount of income-tax which will be payable on the profits of the year; therefore in arriving at the 1939 profits income-tax has been reserved at 7s. 6d. in the pound, whereas for 1938 the income-tax reserve was calculated at 5s. 6d. in the pound on that year's profits.

Result of Year's Operations

The balance on the Profit and Loss Account brought forward from last year is £137,167, so that adding the amount of net income for the year there is a total of £271,045, and deducting the interim dividend on preference stock paid in October last, there remains available a balance of £249,839. From the Balance-Sheet you will see that of this amount the proposed final dividend on preference stock and the dividend on ordinary stock for the year absorb £109,447, leaving £140,392 to be carried forward to next year.

Details of the proposed final dividend on the preference stock and the dividend on the ordinary stock are set out in the Directors' report, and you will have noticed that it is proposed that the dividend on the ordinary stock shall be at the rate of 6%, less tax.

Some of you may be inclined to ask why a larger dividend cannot be paid by using a part of the general reserve or part of the balance of Profit and Loss Account brought forward from the previous year. Your Directors have given this matter the most careful consideration from all points of view, but they feel they are not justified in recommending more. The length of the war cannot be estimated, and in present conditions probably our trade will be mainly in armament work, with a very limited margin of profit. Further, when we are fortunate to return to peace times we shall find, in common with other manufacturers, that a little time will elapse before there is a normal demand for our domestic appliances. After the war it will probably be necessary to incur heavy expenditure in buying new machinery and tools, and also in producing new designs and making new patterns. In all these circumstances the Directors think it prudent to conserve our resources.

I feel at this stage I must give a note of warning regarding the prospects for the present year. In view of our experience of the last four months of 1939 and the serious effect the outbreak of war had on our sales of domestic appliances, it is impossible to make any optimistic prediction as to the probable trading results for 1940. Our surplus productive capacity is being adapted and utilized as rapidly as possible for war work for which orders are already being obtained and executed in increasing quantities. It will be appreciated, however, that, even when it may have proved possible to utilize fully those spare facilities which can be suitably adapted to war work, the margin of profit on such work can only provide a small contribution to the exceptional charges we are bound to carry in the cost of the specialized staff necessary for the maintenance of our gas apparatus trade and in order to be ready with a programme for the production of new goods as soon as the war is over.

Research and Development Work

I should now like to refer to the important research and development work which is being done by our technical staff. One of the advantages which resulted from the formation of Radiation, Ltd., in 1919 was the pooling of the resources of the laboratory and technical sections. The central laboratory organization was set up; this developed rapidly and resulted in the equipment of a Central Research Department in London, and the laboratories there were opened in 1925 by Sir David Milne-Watson. As the activities of this section increased the number of staff was considerably enlarged. The Research Department has been most successful and has built up a wide reputation in the Industry.

In 1936 a new building was erected in Birmingham, so designed as ultimately to provide for the accommodation of the whole of the staffs engaged in the research and development laboratories, together with the staff of the drawing office, and, in the earlier half of last year it was decided to transfer the research staff from London to this building in Birmingham. In view of the considerable development of our technical activities as a result of the war, this centralization has proved most valuable to us, and in making reference to this section of our work I want first of all to tell you something of what we had been doing with our standard gas heating and cooking apparatus, and then to make reference to the specialized work called for in connexion with our wartime activities.

In the field of domestic heating the name of Radiation, Ltd., is especially associated with the appreciation of the value of radiant heat for the warming of living rooms and with the utilization of the luminous gas flame in fires intended for this purpose. Prior to the outbreak of war we had completed arrangements to place on the market this year two entirely new series of gas fires. Although it was realized that we could not expect anything approaching the normal peacetime demand for new goods, we felt it would be to the interest, not only of our organization, but of the Industry as a whole, to make available these new and improved appliances.

"Silent Beam" and "Solbeam" Fires

There are two designs of luminous flame fire, which we have called the "Silent Beam" and the "Solbeam" respectively, and

they have been extremely well received by gas undertakings throughout the country. In fact, in our long experience we cannot recollect any marked departure in design being received more cordially than these new gas fires. The "Silent Beam" especially represents such a departure from the gas fire as hitherto known that in itself it has had a stimulating effect on the Gas Industry; it is a fire that gives a real feeling of comfort, and, in addition, is absolutely silent in operation.

The second type of fire also is not only quite different from gas fires that have been available hitherto, but it is also quite different in appearance and performance from the luminous flame fires to which I have just referred. This fire we have called the "Horizon." Here we have as radiant heat emitters three horizontal elements which, at a distance, look like brightly incandescent rods, while from the upper portion of the fire there pours a steady stream of heated air. The control tap is so designed that either one, two, or three of the heating elements can be used. With this fire all parts of a room become quickly warmed, whether directly visible from the fireplace or not.

Large Cooking Apparatus

The only other "peacetime" activity to which I will make reference is our continued development of large cooking apparatus of the highest efficiency and quality for use in institutions, hospitals, works canteens, and the like. The standard of performance, design, and manufacture of the Radiation apparatus is exceeded by none. It is perhaps not difficult to make some sort of appliance which can be called a cooker, but you will realize that considerable experience and specialized knowledge are necessary to reach and maintain the high standard of performance which characterizes our goods.

Our large apparatus section undertakes not merely the supply of specialized cooking apparatus for completely equipping and ventilating kitchens in the largest of hospitals and canteens, but also undertakes the fitting up of attractive milk and snack bars. The standards of performance which we attain are so much in advance of those generally thought to be satisfactory that one of the surest ways of keeping down expenses in these times of increasing fuel charges is by installing Radiation apparatus. Here we have true economy.

Our Radiation factories are primarily equipped for the efficient and economic production of cooking and heating appliances. Following the declaration of war the special terms and facilities which gas undertakings have been in the habit of allowing to consumers purchasing gas apparatus had to be withdrawn, and, as you know, the domestic building trade practically stopped. The immediate effect was a considerable falling off in the demand for our standard products, so that immediately the normal working of our factories was disorganized. Steps were taken at once, however, to turn our activities over to emergency work so that the whole of the important organization of Radiation should be made available for satisfying the country's immediate needs, and the possibility explored of making a variety of goods necessary for the prosecution of the war.

Production of Engineering Castings

New types of cast iron are required, and we have made available "Radiron," which is supplied in three different grades for a variety of purposes. The change-over from the making of "light castings" to the production of engineering castings has been duly effected. The capacity of our various foundries already amounts to a very large tonnage of castings each week, but if required the normal production could be considerably increased.

The activities of our machine shops and our metal working shops have been extended to enable them to deal with classes of work widely differing from those handled during their normal activities. We have emergency work on hand, and although such orders have increased steadily, we are hoping that our organization will be called upon to render the country the much greater service of which we are capable.

As to the future—while the war continues our principal effort must be to help in its successful prosecution, but at the same time we shall press on with all desirable developments so that when peace arrives we shall be in a position to supply the Gas Industry with new and improved types of apparatus, representing a marked advance on those available prior to the outbreak of hostilities.

In the meantime we shall be constantly on the lookout for new means whereby still further economies in expenditure can be effected, and I can assure you that the efficiency of the business is being closely watched by the Directors in the difficult times through which we are passing.

Safeguarding Goodwill

During the war period the demand for our ordinary products may be somewhat restricted; nevertheless, it is important that we safeguard our valuable goodwill. In this connexion, while our advertising expenditure naturally has been reduced the Directors have decided it must be continued to the extent necessary fully to maintain the strength of our position with the Gas Industry and with the public.

In conclusion I would like to express my appreciation to the officials, staff, and workpeople for their loyalty and the good work they have done in the past year, which you will realize has been a particularly difficult one.

The CHAIRMAN then formally moved:

> "That the Directors' Report and Accounts for the year ended Dec. 31, 1939, as presented by the Directors, be received and adopted, and that dividends be declared as follows: Dividend of 3%, less income-tax, for the half-year to Dec. 31, 1939, on the 6% cumulative preference stock; and a dividend of 6%, less income-tax, on the ordinary stock for the year to Dec. 31, 1939."

Mr. J. F. DAVIES (Deputy-Chairman) seconded the resolution, and it was carried unanimously.

Mr. J. Ivan Yates and Dr. Harold Hartley were re-elected Directors, and the Auditors, Messrs. Peat, Marwick, Mitchell & Co., were reappointed.

The proceedings terminated with a hearty vote of thanks to the Chairman, Directors, and staff.

Gas Undertakings' Results

Auckland, N.Z.

The report of the Directors of the Auckland (New Zealand) Gas Company, Ltd., for the past year states that the profits (after deducting working expenses, rates and land tax, depreciation, and other charges) amount to £102,386, which compares with £98,568 for the preceding year. Receipts for gas, residuals, fittings, &c., are up nearly £30,000 at £467,073, but nearly the whole of this gain was absorbed in additional costs of manufacture and distribution, and further substantial provision has had to be made for income-tax. The dividend for the year is 4½%, as against 5% for the previous twelve months, after which the carry-forward will be decreased by some £500, to £10,328.

Barnard Castle

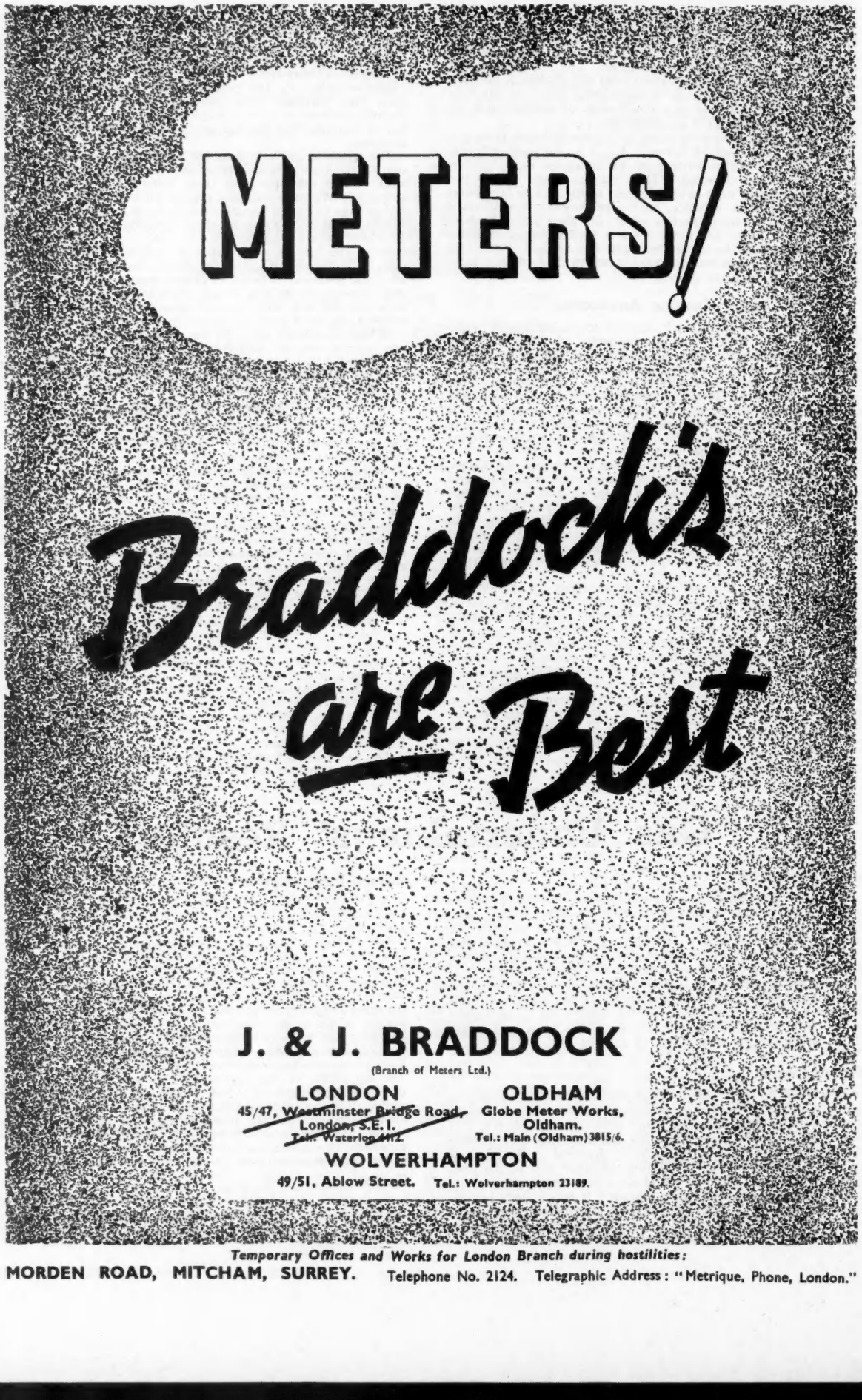
War conditions have hit the Barnard Castle Gas Company especially hard. The report submitted at the annual meeting showed a gross profit of £293, and after meeting charges for interest and income-tax the Directors regretted that they are unable to recommend the payment of a dividend. But for the abnormal conditions prevailing during the latter part of the year, the position of the Company would have been improved, as more gas is being used for domestic purposes. It was stated that the Directors had given serious consideration to the position created by increased costs, but they did not wish to resort to higher prices for gas unless it was impossible otherwise to carry on.

Colonial Association

A history of the first fifty years of the Colonial Gas Association, Ltd., which, with its subsidiary undertakings, now ranks as the fifth gas company in Australia, is recorded in an illustrated booklet to which reference was made on p. 501 of the "JOURNAL" dated Dec. 6 last. A report of the proceedings at the fifty-first annual general meeting—for the year ended June 30, 1939—reveals a continued increase in gas sales. These increases have partly accrued from the policy of the Company in adapting tariffs to changing and competitive conditions, and partly reflect the building activity of the year. The institution of special tariffs to promote and stimulate sales is being constantly justified. The use of gas for cooking, sterilizing, water heating, refrigeration, and laundry work in country hospitals has extended greatly during recent years. The net profit for the year is £85,590, and the dividend on the ordinary shares is 6%. After transferring £7,500 to the credit of reserves, the carry-forward (£25,454) is practically the same as the amount brought in. In actual figures, the quantity of gas sold shows an increase of 4.84% upon the sales of the preceding twelve months. The corresponding increase in the amount sold by subsidiary gas undertakings is 4.93%.

Corbridge

An increase in the output of gas during the past year of 4.77% was reported at the annual meeting of the Corbridge Gas Company. The accounts showed a profit of £812, and a dividend of 6% was declared.



Temporary Offices and Works for London Branch during hostilities:
MORDEN ROAD, MITCHAM, SURREY. Telephone No. 2124. Telegraphic Address: "Metrique, Phone, London."

Current Sales of Gas Products

The London Market

April 1.

Current values of tar products are as under:

Pitch is rising, and is said to be about 50s. per ton f.o.b.

Creosote about 5d. per gallon.

Refined tar 3¾d. to 4d. per gallon.

The price of pure toluole under the Ministry of Supply Order is just under 2s. 5d. per gallon.

Pure Benzole is about 1s. 10d.

95/160 solvent naphtha about 1s. 11d.

90/160 pyridine about 16s. to 17s.

All per gallon naked.

Refined naphthalene crystals about £20 per ton in bags.

All *ex* makers' works.

The Provinces

April 1.

Crude Gas-Works tar, 29s. to 34s.

To avoid misunderstanding, it is necessary to state that the above price is not claimed to represent a market value. It is a price worked out from week to week upon a system which has been used for many years as a basis for the fixing of certain contracts for crude tar of varying qualities in different areas.

The average prices of gas-works products during the week were: Pitch—East Coast, 47s. 6d. to 52s. 6d. f.o.b. West Coast—Manchester, Liverpool, Clyde, 47s. 6d. to 52s. 6d.* Toluole, naked, North, 1s. 9½d. (Controlled by the Ministry of Supply Order No. 1, which fixes the maximum price at which this material may be sold). Coal tar, crude naphtha, in bulk, North, 9d. to 9½d. Solvent naphtha, naked, North, 1s. 8d. to 1s. 9d. Heavy naphtha, North, 1s. 4½d. to 1s. 5½d. Creosote, *ex* works, in bulk, North, liquid and salty, 4¾d. to 5d.; Scotland, 4¾d. to 5d.; low gravity, 4¾d. to 5d. Fuel Grade, 4d. to 4¼d. Carbolic acid, 60's, 3s. 6d. to 3s. 7½d. Naphthalene, £15 to £20. Salts, 75s. to 85s., bags included. Anthracene, "A" quality, 4½d. to 4¾d. per minimum 40% purely nominal. Heavy oil: Unfiltered anthracene oil, (min. gr. 1,080), 5¼d. to 5½d.; filtered heavy oil (min. gr. 1,080), 5¾d. to 6d.; heavy anthracene oil gr. less than 1,080, 6d. to 6¼d.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls, whatever they may be.

Scotland

GLASGOW, March 30.

Quite a fair volume of new business has been placed during the week and prices continue steady.

Crude gas-works tar.—Actual value is unchanged at round 35s. to 37s. per ton *ex* works in bulk.

Pitch.—Vertical quality as available in this district, is now valued at 32s. 6d. to 35s. per ton f.o.b. for export and about 30s. per ton *ex* works in bulk for home trade.

Refined tar.—Quotations are well held for delivery in the home market at 4¼d. to 4½d. per gallon, while for export supplies can be secured at 2½d. to 2¾d. per gallon, both f.o.r. naked.

Creosote oil.—A steady throughput is being maintained with prices as under: Specification oil, 5d. to 5¼d. per gallon; low gravity, 6¼d. to 6½d. per gallon; neutral oil, 5½d. to 5¾d. per gallon; all *ex* works in bulk.

Cresylic acid.—This product remains rather quiet with quotations at round the following: Pale, 97/99%, 2s. 1d. to 2s. 3d. per gallon; dark, 97/99%, 1s. 10d. to 2s. per gallon; pale, 99/100%, 2s. 6d. to 2s. 9d. per gallon; all *ex* works in buyers' packages.

Crude naphtha is only available in small quantities and is called about 7d. to 7½d. per gallon *ex* works in bulk, according to quality.

Solvent naphtha.—90/160 grade is 1s. 8d. to 1s. 9d. per gallon, and 90/190 heavy naphtha is about 1s. 4d. to 1s. 5d. per gallon.

Motor benzole remains at 1s. 6¼d. to 1s. 7d. per gallon.

Pyridine is well looked after with 90/160 grade at 18s. to 19s. per gallon and 90/140 grade at 20s. to 21s. per gallon.

Contracts Advertised

Coal Storage Bunker.

Penrith Gas Department. [p. 54.]

Resetting Retorts.

Penrith Gas Department. [p. 54.]

Coal.

Chelmsford Gas Department. [p. 54.]

Results at Prescot

In their report for the past year, the Directors of the Prescot and District Gas Company express regret that they are unable to recommend a final dividend on the ordinary shares, owing to the unfavourable trading conditions experienced since the outbreak of war. To meet the increased operating expenses, the price of gas was raised 1d. per therm as from Jan. 1 this year. The sales of gas during the past year amounted to 137,808,300 cu.ft., the receipts from this source being £24,795, as against a total of £22,241 in 1938. Expenditure, however, was about £2,500 more, with the result that the balance carried to profit and loss account on the present occasion is only £2,987, as compared with £5,054 last year. A dividend at the rate of 5% per annum was paid on the ordinary shares for the first half of 1939.

A.R.P.

PROTECTION OF SANDBAGS.

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GAS STOCKS AND SHARES

Markets opened quietly after the holidays but the tone generally was satisfactory. As the week progressed, however, a stronger tendency developed and conditions became more active. British Funds on the whole maintained their levels although final quotations in a few cases were fractionally lower—2½% Consols closing at 72¼ against 72½ a week ago. Several of the leaders in the industrial section were strongly supported and prices improved, but coal, iron, and steel shares were an exception and failed to maintain their former high levels. Oil, rubber, and tea shares lacked interest and prices eased.

The Gas Market also opened quietly, but as elsewhere more demand set in later and the few price movements were mostly in an upward direction. The recent fractional declines in gilt-edged stocks have militated against any improvement in Gas Light units which in sympathy with these securities dropped another 3d. last week to 17s. On the whole, the increases in price are still confined to the fixed-interest stocks, and since the return on these at current prices is in a large number of cases between 4½% and 5%, there is no doubt that if and when more of this class of stock becomes available quotations will harden still further. That so many are closely held is evidenced by the fact that in the case of a number of stocks many months have elapsed, in some instances over a year, since the last recorded transaction has appeared. The biggest rise among these stocks occurred in East Surrey 5% debenture with a gain of 7½ to 102½, Bournemouth 6% preference coming next with a 3 points gain to 118½. South Metropolitan 6% preference which ranks prior to nearly seven millions of ordinary stock appears attractive at the present price and should be obtainable at round about 109 to yield 5½%.

Official Quotations on the London Stock Exchange

Issue. £	When ex-Dividend.	Dividends Prev. Hf. Yr. % p.a.	Dividends Last Hf. Yr. % p.a.	NAME.	Quotations Mch. 29.	Rise or Fall on Week.
1,767,439	Mch. 11	8	7	Alliance & Dublin Ord. ...	108—113	−2½
374,000	Dec. 27	4	4	Do. 4 p.c. Deb. ...	80—90	...
877,576	Nov. 6	5	5	Assed. Gas & Water U'd'ts Ord.	14/6—16/6	...
500,000	"	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	16/6—18/6	...
535,545	"	4	4	Do. 4 p.c. Red. Cum. Pref.	15/—17/—	...
318,730	"	4	4	Do. 4 p.c. Irred. Cum. Pref.	13/6—15/6	...
750,000	Mch. 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	82—87*	...
360,070	Feb. 19	7	7	Barnet Ord. 7 p.c.	122—127	...
300,000	Oct. 9	1/9⅜	1/4⅜	Bombay, Ltd.	20/—22/—	...
181,915	Feb. 26	9½	9½	Bournemouth Sliding Scale ...	145—150	...
690,526	"	7	7	Do. 7 p.c. max. ...	118—123	...
493,960	"	6	6	Do. 6 p.c. Pref. ...	116—121	+3
50,000	Dec. 18	3	3	Do. 3 p.c. Deb. ...	70—75	...
362,025	"	4	4	Do. 4 p.c. Deb. ...	95—100	...
335,000	"	5	5	Do. 5 p.c. Deb. ...	105—110	...
357,900	Feb. 19	7½	6¾	Brighton, &c., 6 p.c. Con. ...	103—108	...
489,955	"	6¾	5⅞	Do. 5 p.c. Con. ...	100—105	...
205,500	"	6	6	Do. 6 p.c. 'B' Pref. ...	103—108	...
885,000	Mch. 11	7	8	British Ord.	98—108	−1½
100,000	Dec. 18	7	7	Do. 7 p.c. Pref.	120—125	...
350,000	"	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	110—115	...
120,000	"	4	4	Do. 4 p.c. Red. Deb.	73—78	...
460,000	"	5	5	Do. 5 p.c. Red. Deb.	98—103	...
180,000	22 May '33	6	4	Cape Town, Ltd.	½—¾	...
180,000	6 Nov. '33	4½	4½	Do. 4½ p.c. Pref.	½—¾	...
150,000	Dec. 18	4½	4½	Do. 4½ p.c. Deb.	55—65	...
626,860	Jan. 29	6	5 3/10	Cardiff Con. Ord.	103—108	...
237,860	Dec. 18	5	5	Do. 5 p.c. Red. Deb. ...	95—100	...
98,936	Oct. 9	2/—	2/—	Colombo Ord.	1½—1¾	...
24,510	"	1/4⅜	1/4⅜	Do. 7 p.c. Pref.	20/6—22/6	...
739,453	Mch. 26	−/11.48	−/11.48	Colonial Gas Assn. Ltd. Ord. ...	14/6—16/6*	−−/6
296,144	"	1/3.30	1/3.30	Do. 8 p.c. Pref.	20/—22/−*	−−/6
1,775,005	Jan. 29	4	2	Commercial Ord.	47—52	...
140,000	Feb. 19	4	4	Do. 4 p.c. Red. Pref. ...	87—92	...
620,000	Dec. 11	3	3	Do. 3 p.c. Deb.	62—67	...
286,344	Feb. 19	5	5	Do. 5 p.c. Deb.	95—100	...
280,000	"	3⅜	3⅜	Do. 3⅜ p.c. Red. Deb. ...	93—98	...
807,560	Feb. 12	7	7	Croydon sliding scale ...	98—103	...
644,590	"	5	5	Do. max. div.	84—89	+1
620,385	Dec. 7	5	5	Do. 5 p.c. Deb.	100—105	...
408 660	Feb. 19	5	5	Dudley, Brierley Hill & Dist. Ord.	98—103	...
82,275	"	5	5	Do. 5 p.c. Con. Pref. ...	93—98	...
79,000	"	3⅜	3⅜	Do. 3⅜ p.c. Red. Deb. ...	93—98	...
239,000	Jan. 29	5	88/6	East Hull Ord. 5 p.c.	80—90	...
187,215	Feb. 12	5⅜	5⅜	East Surrey Ord. 5 p.c. ...	93—98	...
176,211	Dec. 18	5	5	Do. 5 p.c. Deb. ...	100—105	+7½
250,000	Nov. 13	8	4	Gas Consolidation Ord. 'B' ...	14/—17/—	...
250,000	"	4	4	Do. 4 p.c. Red. Cum. Pref.	16/—18/—	...
19,152,410	Jan. 29	5⅜	3⅜	Gas Light & Coke Ord. ...	16/6—17/6a	−−/3
2,400,000	"	3½	3½	Do. 3½ p.c. max.	62—67	...
4,477,106	"	4	4	Do. 4 p.c. Con. Pref. ...	86—91	+1
2,993,000	Jan. 2	3⅜	3⅜	Do. 3⅜ p.c. Red. Pref. ...	87—92	...
8,602,497	Nov. 27	3	3	Do. 3 p.c. Con. Deb. ...	77—82	...
3,642,770	"	5	5	Do. 5 p.c. Red. Deb. ...	105—110	...
3,500,000	"	4½	4½	Do. 4½ p.c. Red. Deb. ...	102—107	...
700,000	Mch. 11	3½	3½	Do. 3½ p.c. Red. Ded. ...	87—92	...
270,466	Feb. 19	6	6	Harrogate New Cons.	93—98	...
157,500	Mar. 20	‡1/—	‡1/—	Hong Kong and China Ord. ...	½—¾	...
5,600,000	Oct. 23	12	4	Imperial Continental Cap. ...	80—85	...
172,810	Jan. 29	3½	3½	Do. 3½ p.c. Red. Deb. ...	80—85	...
63,480	Dec. 18	3	3	Maidstone 3 p.c. Deb.	55—60	...
45,000		†10	†8	Malta & Mediterranean ...	92—102	...
				Metropolitan (of Melbourne) ...		
				5½ p.c. Red. Deb.	95—100	...
392,000	Oct. 2	5½	5½	M.S. Utility 'C' Cons.	75—80	...
231,977	Feb. 19	5	5	Do. 4 p.c. Cons. Pref. ...	82—87	...
368 ,658	"	4	4	Do. 4 p.c. Deb. ...	85—90	...
390,076	Dec. 18	4	4			

Issue. £	When ex-Dividend.	Dividends Prev. Hf. Yr. % p.a.	Dividends Last Hf. Yr. % p.a.	NAME.	Quotations Mch. 29.	Rise or Fall on Week.
148,955	Dec. 18	5	5	M.S. Utility 5 p.c. Deb. ...	102—107	...
125,000	Jan. 2	3½	3½	Do. 3½ p.c. Red. Bds. ...	90—95	...
675,000	Nov. 6	†3	†4	Montevideo, Ltd.	55—60	...
250,000	Mch. 18	7½	5 7/10	North Middlesex 6 p.c. Con. ...	103—108*	...
396,160	Jan. 29	5	5	Northampton 5 p.c. max. ...	90—95	...
300,000	Nov. 6	†7	9	Oriental, Ltd.	118—123	...
468,537	Dec. 11	8	7	Plymouth & Stonehouse 5 p.c.	114—119	...
621,667	Feb. 5	8½	8½	Portsmouth & Gosport Cons.	110—115	...
241,446	"	5	5	Do. 5 p.c. max.	85—90	...
73,350	"	5	5	Do. 5 p.c. Pref.	90—95	...
75,000	"	4	4	Do. 4 p.c. Pref.	75—80	...
114,000	Feb. 5	5	5	Preston 5 p.c. Pref.	88—93	...
247,966	Dec. 18	4	4	Primitiva 4 p.c. Cons. Deb. ...	93—98	...
625,959	Jan. 15	4	4	Do. 4 p.c. Red. Deb. ...	91—96	...
15,000	Mch. 11	6	6	San Paulo 6 p.c. Cum. Pref. ...	7½—8½	...
441,275	Oct. 9	1/1½	1/1½	Severn Val. Gas Cor. Ld. Ord.	17/—19/—	...
460,810	Mch. 11	−/10½	−/10½	" " 4½ p.c. Cum. Pref. ...	16/6—18/6	...
133,201	Feb. 12	8½	5	Shrewsbury 5 p.c. Ord. ...	105—115	...
9,000	June 5	‡4	‡4	South African Ord.	4—5	...
1,996,297	Aug. 21	1/2⅜	1/2⅜	South East'n Gas Cn. Ld. Ord.	16/—18/—	...
1,000,000	Mch. 4	−/10½	−/10½	Do. 4½ p.c. Red. Cum. Pref.	16/6—18/6	...
769,191	"	4	4	Do. 4 p.c. Cum. Pref. ...	14/6—16 6	...
150,000	Feb. 12	3½	3½	Do. 3½ p.c. Red. Deb. ...	89—94	...
6,709,895	"	5	4	South Met. Ord.	70—75	...
1,135,812	"	6	6	Do. 6 p.c. Irred. Pref. ...	106—111	...
850,000	"	4	4	Do. 4 p.c. Irred. Pref. ...	80—85	...
1,895,445	Dec. 27	3	3	Do. 3 p.c. Deb.	71—76	+1
1,000,000	Jan. 15	5	5	Do. 5 p.c. Red. Deb. ...	102—107	+2
600,000	"	3½	3½	Do. 3½ p.c. Red. Deb. ...	92—97	...
1,543,795	Feb. 5	6	3	South Suburban Ord. 5 p.c. ...	77—82	...
512,925	"	5	5	Do. 5 p.c. Pref.	95—100	...
500,000	"	4	4	Do. 4 p.c. Pref.	82—87	...
250,000	"	3½	3½	Do. 3½ p.c. Red. Pref. ...	86—91	...
888,587	Dec. 11	5	5	Do. 5 p.c. Deb.	103—108	...
250,000	"	4	4	Do. 4 p.c. Deb.	85—90	...
200,000	Feb. 12	3½	3½	Do. 3½ p.c. Red. Deb. ...	87—92	...
427,859	Sept. 18	1/2⅜	9⅜	S. Western Gas & Water Ord.	13/6—15/6	...
160,523	Oct. 9	−/10½	−/10½	Do. 4½ p.c. Red. Cum. Pref.	17/6—19/6	...
110,000	Dec. 18	4	4	Do. 4 p.c. Red. Deb. ...	90—95	...
750,541	Feb. 5	5	5½	Southampton Ord. 5 p.c. ...	77—82	...
148,836	Dec. 27	4	4	Do. 4 p.c. Deb.	85—90	...
350,000	Feb. 12	5½	5½	Swansea 5½ p.c. Red. Pref. ...	97—102	...
200,000	Dec. 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—100	...
1,076,490	Feb. 26	6½	5	Tottenham and District Ord....	93—98	...
409,835	"	5½	5½	Do. 5½ p.c. Pref.	103—108	...
62,235	"	5	5	Do. 5 p.c. Pref.	95—100	...
453,380	Dec. 11	4	4	Do. 4 p.c. Deb.	85—90	...
1,247,505	Oct. 23	6	4	U. Kingdom Gas Cor. Ord. ..	14/—16/—	...
1,085,952	Nov. 20	4½	4½	Do. 4½ p.c. 1st Cum. Pref. ...	15/—17/—	...
772,709	"	4	4	Do. 4 p.c. 1st Red. Cum. Pf.	14/6—16/6	...
745,263	Dec. 18	4½	4½	Do. 4½ p.c. 2nd Non-Cum. Pf.	13/6—15/6	+−/6
1,093,656	Mch. 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	84—89*	...
378,106	Mch. 11	7	7	Uxbridge, &c., 5 p.c.	95—105	...
133,010	"	5	5	Do. 5 p.c. Pref.	95—100	...
1,371,138	Feb. 5	6½	3½	Wandsworth Consolidated ...	87—92	+1
2,525,768	"	4	4	Do. 4 p.c. Pref.	84—89	...
1,343,964	Dec. 18	5	5	Do. 5 p.c. Deb.	103—108	...
383,745	"	4	4	Do. 4 p.c. Deb.	85—90	...
400,000	"	3⅜	3⅜	Do. 3⅜ p.c. Red. Deb. ...	90—95	...
558,342	Jan. 29	6½	6	Watford and St. Albans Ord. ...	95—100	...
200,000	"	5	5	Do. 5 p.c. Pref.	95—100	...
200,000	"	5½	5½	Do. 5½ p.c. Pref.	100—105	...
200,000	"	4	4	Do. 4 p.c. Rd. Pf. (1973/8)	85—90	...
100,000	"	33/4½	4	Do. 4 p.c. Red. Pf. (1959)	93—98	...
200,000	Dec. 11	3½	3½	Do. 3½ p.c. Red. Deb. ...	83—88	...

a.—The quotation is per £1 of Stock. * Ex. Div. † Paid free of income-tax. ‡ For year. § Actual.

Supplementary List and Provincial Exchanges overleaf.

STOCK AND SHARE LIST—Contd.

Supplementary List, not Officially Quoted, London

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Nominal Quotations Mch. 29.	Rise or Fall on Week.
202,152	Mch. 18	5	5	Ascot Ord.	80—85	...
128,182	Dec. 27	5	5	Do. 5 p.c. Pref. ...	88—93	...
31,035	Mch. 4	-/9⅜	-/9⅜	Associated Utilities 4 p.c. Pref.	15/—17/-	...
100,000	Dec. 18	3½	3½	Do. 3½ p.c. Red. Deb. ...	90—95	...
17,000	Feb. 19	8	8	Bognor Orig. Ord. 'A' ...	102—112	...
62,210	,,	8	8	Do. New Add. 'A' ...	102—112	...
87,160	,,	7	7	Do. New 7 p.c. max. ...	95—105	...
37,440	Jaa. 29	10	10	Cam. Univ. & Town 10 p.c. max.	145—155	...
125,970	,,	7	7	Do. 7 p.c. max.	105—115	...
39,025	,,	5	5	Do. 5 p.c. max.	80—90	...
96,410	Jan. 29	4½	4½	Cardiff 4½ p.c. Pref.	90—95	...
55,520	Feb. 19	6	6	Colchester 6 p.c. Pref. ...	95—100	...
90,550	Mch. 18	5	5	Do. 5 p.c. Deb. ...	98—103	...
150,000	Feb. 12	4	4	Croydon 4 p.c. Pref.	82—87	+2
130,000	Dec. 27	4	4	Do. 4 p.c. Deb.	85—90	...
65,000	Mch. 4	7½	6⅞	Eastbourne 'A' 5 p.c.	105—115	...
198,000	,,	6	5⅝	Do. 'B' 3½ p.c.	90—100	...
112,312	,,	5	5	Do. 5 p.c. Pref.	90—95	...
180,000	Dec. 18	5	5	Do. 5 p.c. Deb.	98—103	...
130,500	Feb. 19	7½	7½	Exeter New Ord. (£10) ...	10—12	...
24,000	Aug. 21	8½	8½	Gt. Yarmouth 8½ p.c. max. (£30)	15—20	...
39,400	,,	7½	7½	Do. 7½ p.c. max. (£30) ...	10—15	...
51,160	Dec. 11	5½	5½	Do. 5½ p.c. Deb.	102—107	...
182,600	Feb. 26	8	9	Guildford Cons.	110—120	...
54,055	,,	5	5	Do. 5 p.c. Pref.	90—95	...
68,250	Dec. 11	5	5	Do. 5 p.c. Deb.	90—95	...
156,680	Feb. 19	7	5	Hampton Court Cons. ...	75—85	...
86,046	June 19	‡4½	‡5	Holyh'd&N.W.G.&W.Cpn.Ord.	13/6—15/6	...
90,000	Feb. 12	4	4	Lea Bridge 4 p.c. Pref.	65—75	...
60,000	,,	6	6	Do. 6 p.c. Pref.	105—115	...
94,876	Dec. 18	4	4	Do. 4 p.c. Deb.	75—80	...
73,620	Mch. 18	8½	8½	Luton Cons. 'A'	115—125	...
107,960	Feb. 26	4	5½	Mid Kent Ord. (£10)	7½—8½	...
290,940	Feb. 5	10	10	Oxford & District Ord. ...	135—145	...
97,112	,,	5	5	Do. 5 p.c. Pref.	85—90	...
58,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	100—105	...
126,193	Oct. 30	7½	7½	Peterborough Ord.	140—150	...
64,990	Mch. 18	7	7	Redditch Ord.	100—110*	...
166,850	Feb. 19	8	8	Romford Ord.	108—118	...
60,000	,,	4	4	Do. 4 p.c. Pref.	85—90	...
44,000	Mch. 18	5	5	Do. 5 p.c. Deb.	97—102	...
25,570	Feb. 12	5½	5½	Rugby 5½ p.c. Pref.	95—105	...
25,000	,,	6	6	Do. 6 p.c. Red. Pref. ...	100—105	...
42,750	Dec. 11	5½	5½	Do. 5½ p.c. Deb.	103—108	...
110,950	Feb. 26	8	8	Ryde Ord.	100—110	...
270,086	Mch. 18	7	7	Slough Ord.	98—103	...
21,000	Dec. 11	5	5	Do. 5 p.c. Deb.	92—97	...
28,872	Nov. 6	5½	5½	S. Midland Gas Cpn. Ltd. Ord.	14/—16/-	...
28,866	Mch. 18	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	14/—16/-	...
127,228	Feb. 19	5	7	Swindon Cons.	75—80	...
60,425	Dec. 18	5	5	Do. 5 p.c. Deb.	92—97	...
64,380	,,	5	5	Torquay & Paignton 5 p.c. Pref.	82—87	...
130,000	Feb. 12	5	5	Wakefield Ord.	85—95	...
81,650	,,	5	5	Do. 5 p.c. max.	75—80	...
82,000	Jan. 29	6	6	Weymouth Ord.	82—87	...
273,626	Feb. 12	7	7	Wolverhampton Cons. Ord. ...	115—125	...
98,384	,,	6	6	Do. 6 p.c. Pref.	105—115	...
160,000	Dec. 18	5½	5½	Do. 5½ p.c. Red. Deb. ...	100—105	...
106,490	Mch. 18	5½	5½	Wrexham Ord	75—85*	...
90,000	Dec. 18	5	5	York 5 p.c. Red. Deb.	95—100	...
133,640	Feb. 19	6	6	Yorktown (Cam.) 5 p.c. Cons.	82—87	...
120,000	,,	5	5	Do. 5 p.c. Pref.	85—90	...
35,000	Dec. 18	5½	5½	Do. 5½ p.c. Deb.	103—108	...

BRISTOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Mch. 29.	Rise or Fall on Week.
347,756	Feb. 12	5	6	Bath Cons.	99—103	...
1,667,250	Feb. 5	5	5	Bristol, 5 p.c. max.	103—105	+1
120,420	Dec. 18	4	4	Do. 1st 4 p.c. Deb.	98—101	...
415,250	,,	4	4	Do. 2nd 4 p.c. Deb. ...	98—101	...
328,790	,,	5	5	Do. 5 p.c. Deb.	113—116	...
274,000	Feb. 26	5	5	Newport (Mon.) Ord.... ...	91—94	...
13,200	Mch. 26	7	8⅜	Pontyp'l Gas & W. 10 p.c. 'A'	11⅜—12⅜*	-¼
13,600	,,	5	6	Do. 7 p.c. 'B'	10⅛—10⅜*	-¼
40,000	,,	5	6	Do. 7 p.c. 'C'	10⅛—10⅜*	-¼
140,778	Feb. 12	5	5	Weston-super-Mare Cons. ...	92—96	...
64,338	Dec. 27	4	4	Do. 4 p.c. Deb.	90—95	...
33,340	,,	7½	7½	Do. 7½ p.c. Deb.	140—150	...

LIVERPOOL EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Mch. 29.	Rise or Fall on Week.
157,150	Feb. 5	5	6½	Chester 5 p.c. Ord.	98—101	...
92,500	Dec. 18	4	4	Do. 4 p.c. Pref.	80—84	...
36,430	,,	3½	3½	Do. 3½ p.c. Deb.	85—88	...
41,890	,,	4	4	Do. 4 p.c. Red. Deb. ...	95—99	...
2,167,410	Feb. 19	6	6	Liverpool 5 p.c. Ord.	105—107	+2
245,500	Dec. 18	5	5	Do. 5 p.c. Red Pref. ...	95—100	...
306,083	July 17	4	4	Do. 4 p.c. Deb.	99—101	...
106,280	Feb. 5	10	8	Preston 'A' 10 p.c.	165—175	-6
188,219	,,	7	7	Do. 'B' 7 p.c.	123½—133½	...

NEWCASTLE EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Mch. 29.	Rise or Fall on Week.
122,577	Feb. 19	7	7	Blyth 5 p.c. Ord.	113—118	...
732,000	Feb. 19	4	4	Hartlepool G. & W. Co. & New	63½—64½	...
2,430,267	Feb. 5	5	5 7/40	Newcastle & Gateshead Con.	20/—20/6σ	+/3
682,856	,,	4	4	Do. 4 p.c. Pref.	89—91	...
776,706	Dec. 27	3½	3½	Do. 3½ p.c. Deb.	84—86	...
277,285	April 24	5	5	Do. 5 p.c. Deb. '43 ...	101—103	...
332,351	Feb. 5	6	6	Sunderland 6 p.c. max. ...	109—111	...

NOTTINGHAM EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Mch. 29.	Rise or Fall on Week.
542,270	Feb. 12	6	9	Derby Con.	103—108	...
55,000	Dec. 18	4	4	Do. 4 p.c. Deb.	98—103	...
20,000	Dec. 18	5	5	Long Eaton 5 p.c. Pref. ...	9—11	...
80,000	,,	5	5	Do. 5 p.c. Deb. ...	100—105	...

SHEFFIELD EXCHANGE

Issue. £	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations Mch. 29.	Rise or Fall on Week.
10,000	Feb. 19	10	10	Great Grimsby 'A' Ord. ...	170—180	...
6,500	,,	10	10	Do. 'B' Ord. ...	170—180	...
79,000	,,	10	10	Do. 'C' Ord. ...	160—170	...
1,806,339	Feb. 26	6½	6½	Sheffield Cons.	123—125	...
95,000	Jan. 2	4	4	Do. 4 p.c. Deb.	98—100	...

σ The quotation is per £1 of Stock.
* Ex. div. ‡ For year.

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